TROPICAL DISEASES BUREAU.

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AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

JAMES (W. M.) & DEEKS (W. E.). **The Etiology, Symptomatology and Treatment of Intestinal Amebiasis.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 271–308. [United Fruit Company, Boston, Mass.] Also *Amer. Jl. Trop. Med.* 1925. Mar. Vol. 5. No. 2. pp. 97–136.

In this paper the authors have condensed the results of more than sixteen years of continuous work on intestinal amoebiasis. They consider that this disease is extremely varied in its symptomatology. It may remain latent, without symptoms, and acute, subacute and chronic dysentery are not its most frequent manifestations.

Though *Entamoeba histolytica* is the most important etiological factor, it is often aided by stasis which engenders a temporary or chronic inflammation of the mucosa of the large intestine. The normal habitat of the parasite is the lumen of the large intestine, and it becomes pathogenic only when it invades the tissues ; this invasion may be local or general, and the clinical symptoms will vary accordingly. Reinfection of the bowel wall from the lumen is a very important factor. Treatment, to be successful, should aim at destruction of the parasites in the lumen, as well as those in the bowel wall. The authors' own experience has been that acute and chronic dysenteries were much more frequent 15 years ago than to-day, and they believe that the use of emetine and its modifications has altered very considerably the clinical aspect of amoebic infection. The amount of gastro-intestinal disturbance without the appearance of diarrhoea and dysenteric symptoms, which was due to amoebic infection and was then unrecognized, cannot be stated with certainty. Since they have become familiar with the small precystic and cyst-forming generations of *E. histolytica* they have never failed, with one exception, to find them in the stools of liver abscess cases. The authors believe that amoebic infection in man is for the most part conveyed by the swallowing of particles of fairly fresh faecal material, which, though outwardly dry, contain the cysts in thick moist centres. We know that ascaris infection is conveyed in a similar manner. Dysentery, in epidemic form, follows contamination of the water supplies, and

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is due to a bacillary infection, but when such epidemics do take place in a country where intestinal amoebiasis is endemic, mixed infections occur in a considerable percentage of cases. The pernicious habit of using human faeces as a garden fertilizer is undoubtedly responsible for much endemic infection. This, too, undoubtedly aids in the transmission of infected material.

In countries where amoebic infection is widespread, subacute and chronic appendicitis occurs frequently. Sometimes infiltration of the submucosa of the appendix by entamoebae with or without adhesions has been reported. There is one symptom which is invariably present in amoebic dysentery which, it is claimed, is of considerable diagnostic and prognostic importance, and that is the doughy, inelastic skin. This inelasticity they have termed *myxenoid*, and it is found in very ulcerated or chronic inflammatory conditions of the abdominal viscera. Latent infections are found most frequently in children. James has seen cases of anaemia and emaciation when heavy infections of *E. histolytica* were found. Digestive disturbances are frequently produced, it may be the appendix, or amoebic infiltration of the caecum, or any part of the colon, with resulting reflex as well as local disturbance. Palpation of the colon may elicit definite points of tenderness, while radiographs will not infrequently show a filling defect in the wall of the colon, corresponding to the tender point. Colicky pains may occur with or without constipation, but oftenest in cases with alternating constipation and diarrhoea. These colics, which may be severe, are likely to be confused with appendicitis, cholelithiasis, renal colic and diverticulitis. The milder types of colitis simulate very closely the condition known as mucous colitis, but, unlike the latter, yield rapidly to treatment. Repeated and severe haemorrhages may result from a very small lesion and give rise to the suspicion of malignant disease. Palpable masses in the abdomen resembling tumours may be noted.

Treatment, to be successful, should attack the entamoebae in the lumen of the bowel as well as in the tissues. Emetine acts chiefly upon the tissue parasites. The authors strongly advocate bismuth subnitrate, which has been in use for over thirty years ; the combined emetine and bismuth treatment is still being used in Panama with the result that none of the cases treated have become chronic and, as far as can be ascertained, 75 are still residing at Panama or in the Canal Zone. During the period 1914–1923, 95 cases were admitted to the hospitals with liver abscess, and 17 of them died (18 per cent.). During Deeks' experience in the Canal Zone they were able to follow 66 treated cases over a period of several months, and found that relapses occurred in 4½ per cent. James has shown that bismuth salts have an indirect influence on the entamoebae, which early show degenerative changes. The authors believe that certain products of putrefaction are essential to the life of the organisms, and that bismuth acts either by destroying the putrefactive bacteria, or in neutralizing some product essential to the existence of the entamoebae. Bismuth subnitrate is given in heroic doses, 180 grains mechanically suspended in a tumbler-full of milk or water every 3 hours, night and day in severe cases. Occasional untoward effects noted—cyanosis and forcible heart's action—are due to the use of impure bismuth. Out of 100 cases of liver abscess admitted to Ancon hospital in only 2 had the bismuth treatment been previously administered. Judging from clinical experience cases of dysentery are cured in this manner with but few relapses.

Other methods of treatment, such as powdered Brazilian ipecacuanha root, Chapparo amargosa and salvarsan preparations, have been tried, but are not recommended. Together with the bismuth treatment, which may be continued for at least 6 weeks, a non-irritating diet must be persisted in for 2 or 3 months. During the first 10 days of treatment a very strict diet must be adopted. Emetine itself is a powerful cardiac depressant, and at times is a nerve poison ; localized, as well as multiple neuritis, resembling beriberi in its manifestations, may result. Stomatitis may occur. Emetine should never be used if surgical intervention is contemplated.

P. H. Manson-Bahr.

GARIN (Ch.) & LÉPINE (Pierre). **Étude de 208 cas d'amibiase recueillis dans la région lyonnaise ; thérapeutique arsenicale.**—*Presse Méd.* 1924. Nov. 22. Vol. 32. No. 94. pp. 927–929.

The authors consider that amoebiasis was introduced into France by Colonial troops during the war. In order to ascertain whether the infection was spreading, or the reverse, an investigation was undertaken in the vicinity of Lyons. 208 cases have been observed in less than four years, 191 of which were in men, 16 only in women, and one in a child. The series was classified into two main groups : those of exotic origin and those due to indigenous infection. The great majority belonged to the former group, the infection having been contracted in Macedonia, Indo-China, Morocco, Egypt, West Africa, etc. Forty indigenous cases are cited, 35 in men and 5 in women ; of these 21 had been in contact with Colonial troops during the war and in 11 the source of infection could not be determined. To summarize, 81 per cent. were infected abroad, 19 per cent. on French soil. Close contact with infected human beings was responsible for 72·5 per cent. of the cases. In about 10 per cent. of instances women appear to have contracted the infection from their husbands. From the prophylactic point of view this experience points to the dangers arising from repatriation of men who have lived for any length of time in the tropics, and suggests an increased vigilance at the frontiers to prevent the importation of amoebiasis. [How this is to be effected is not quite clear.]

Amongst the complications of amoebiasis which have been noted are six cases of liver abscess (2 autochthonous), a subperiosteal abscess of amoebic origin associated with a fatal hepatic abscess, one of bronchopneumonia, oedema of the lung also associated with the same condition, and anaemia, which may be of a grave character. The solar plexus and the suprarenal glands appear to be often affected. Amoebiasis is frequently associated with pulmonary tuberculosis, and in this series especially with malaria—in 128 instances. Treatment by stovarsol—75 cgm. daily for 10 days—is outlined ; antirelapse treatment on these lines should consist of 25 cgm. of this drug every two days. Acetylarsan, a little known drug, has given very satisfactory results. It is administered either by subcutaneous or intramuscular injection, 75 cgm. once a week for four injections. This treatment can be combined with emetine, of which three injections are given weekly. After a month of such treatment the cysts disappear from the stools.

P. H. M-B.

Scott (George H.). **Amoebic Dysentery in the Army.**—*Milit. Surgeon.* 1924. Dec. Vol. 55. No. 6. pp. 722–736. [13 refs.]

The admission rate for dysentery for natives in the U.S. Army is considerably higher than for American troops; this applies to all forms. It is probable that many native soldiers are infected prior to enlistment. The death rate for amoebic dysentery for the past four years is extremely low, due to effective treatment, especially emetine. No deaths were registered from this cause in American or native troops in 1920, 1921 or 1922.

P. H. M-B.

von Krogh (Mentz). **Kronisk aõmbedysenteri.** [Chronic Amoebic Dysentery.]—*Norsk Mag. f. Laegevidenskaben.* Oslo. 1925. Feb. Vol. 86. No. 2. p. 128.

In Argentina about three-fourths of the population have, at some period of their lives, been attacked by amoebic dysentery in an acute or chronic form. Usually the parasite cannot be demonstrated. It would be a great mistake in these cases to make the diagnosis dependent on the finding of the amoeba. Emetine is the sovereign remedy for the chronic, just as for the acute form.

E. E. Atkin.

Montel (G. H. M.) & Montel (M. L. R.). **Un nouveau cas d'adénopathie iliaque d'origine probablement amibienne.**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 629–630. [1 ref.]

In a recent communication (see this *Bulletin*, Vol. 21, p. 470) one of the authors described ten cases of enlargement of the iliac lymphatic glands in Annamites, said to be due to acute or chronic amoebiasis. A similar occurrence in a European is here reported. Unfortunately his faeces were not examined. The patient was suffering from diarrhoea and colic, and a palpable mass was discovered in the right iliac fossa; subsequently, on radiographic examination, a shadow was seen in the same situation. On emetine treatment the glandular mass subsided, and the patient recovered.

[The inference that this adenopathy was of amoebic origin is very weak, especially when a strong positive Wassermann reaction, which is recorded, would suggest an entirely different explanation.]

P. H. M-B.

Heimburger (L. F.). **Amebiasis Cutis. With a Survey of the Medical Literature to Date.**—*Arch. Dermat. & Syph.* 1925. Jan. Vol. 11. No. 1. pp. 49–55. With 2 figs. [9 refs.]

A case of amoebic infection of the skin is here described. The patient, a Chinese farmer, had suffered from a tumour in the loin which, on rupturing, discharged liver pus. From that time an ulcer had developed in the right lumbar region in the mid axillary line, measuring 12 by 6 cm. and 4 cm. in depth; the edges were indurated, everted and raised above the surrounding skin with a border of hyperpigmentaion. The odour of the exuding pus was foul. A sinus was discovered which opened on the floor of the ulcer and communicated with a cavity in the liver. The pus from this sinus contained numerous amoebae. Under emetine treatment the amoebae

disappeared from the pus, so that at the sixth injection of 2 gr. daily no more could be found. In stained sections of tissue excised from the floor of the ulcer and one removed from its edge amoebae were found. Not only were they present in the pus from the surface, but also in capillaries and lymph spaces of the subcutaneous and granulation tissue. In one individual an ingested red blood corpuscle could be distinguished. Dr. COUNCILMAN, to whom these sections were shown, verified the correctness of the diagnosis. The foregoing findings together with the history of chronic dysentery and intense hepatic pain led to a diagnosis of amoebic infection of the skin subsequent to the discharge of liver abscess pus. Under emetine injections (18 gr.) the pyrexia remitted and the ulcer rapidly healed. The ulcer was dressed with pulverized ipecacuanha. The patient left hospital eleven weeks after admission in good health. At no time could amoebae be demonstrated in the faeces. Heimburger thinks that the present is the second authentic case of amoebic infection of the skin. The only previous minute description of the organisms in the skin is the one by ENGMAN and HEITHAUS [this *Bulletin*, Vol. 17, p. 13].

The author draws attention to the fact that amoebic infection of the skin does occur and that care should be taken to prevent it after operative treatment for amoebic abscess of the liver.

P. H. M-B.

DE MELLO (Froilano). **Note sur les amèbes rencontrées dans les ulcères fuso-spirillaires d'Angola.**—*Revista Méd. de Angola.* (No. especial 1ᵉ Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 75–81. With 1 plate. [2 refs.]

After reading DOBELL's criticisms of " amoebae " found in cutaneous lesions, the author happened to examine some pus from an ulcer in a European, in which he saw some undoubted amoebae exhibiting feeble movements in a hanging-drop preparation. Some of the material was stained by Leishman and numerous spirochaetes and fusiform bodies demonstrated. In some films fixed wet in Bouin and stained with haematoxylin structures are encountered which are figured in the plate and are [according to the author] undoubtedly *E. histolytica*. Some of the cells which he has figured are regarded as cysts. The author concludes that in Angola certain intestinal amoebae, " it may be *E. histolytica* or *E. coli*," can invade the skin and are probably inoculated into sores by flies. These amoebae are probably symbiotic with the spirochaetes.

[The author has been unable to assign several of the structures figured in his plate to any known species of amoeba parasitic in man. The figures certainly depict some curious cells upon the nature of which it is difficult to enlighten him.]

P. H. M-B.

SHARP (Clive J. H.) & MORRISON (Henry). **Entamoebae as an Etiological Factor in Multiple Abscesses.**—*Brit. Med. Jl.* 1925. Jan. 31. pp. 205–206. [4 refs.]

Multiple abscesses are of frequent occurrence in Nigeria ; they are of two main clinical types affecting the muscles of the limbs and the ilio-psoas muscle. Some of them are believed to be due to entamoebae.

In confirmation of this view a case is cited of an African servant who suffered from deep abscesses in the arms, thigh and left buttock. Entamoebae were found in the pus and healing rapidly took place after injection of emetine. The organisms exhibited active movements. The serious condition of the patient, the physical peculiarities and sterility of the pus point to the amoebae as being the cause of the condition.

P. H. M-B.

ALLEN (G. V.). **Notes on a Case of Infection of the Ileum with** *Entamoeba histolytica.*—*Kenya Med. Jl.* 1924. Nov. Vol. 1. No. 8. pp. 238–239. With 1 plate.

Infection of the small intestine with *Entamoeba histolytica* is rare. So far only two instances are on record, one published by HARRIS in 1898, the other by KUENEN in 1909. The patient was an adult male Masai, a prisoner, who had suffered from diarrhoea and dysentery, but not of a severe type. Death took place suddenly. At autopsy ulceration of the lower twenty-four inches of the ileum was noted. The ulcers, for the most part, were superficial; only one, 1 by 0·5 cm., was large; the remainder were very minute. The large intestine was intensely ulcerated; some of the smaller lesions were typical in shape. Microscopical sections of the ileum showed individual entamoebae in spaces in the submucosa and mucosa and in one section between the fibres of the circular muscle. In sections of ulcers in the large intestine the amoebae were found to be numerous in spaces between the fibres of the circular muscle. A microphotograph of the section of the ileum shows *E. histolytica* in position.

P. H. M-B.

THURSTON (E. Owen). **Liver Abscess. A Series of Sixty-Four Cases.**—*Lancet.* 1924. Nov. 15. pp. 1008–1010. [4 refs.]

Thurston affirms that the aspiration treatment of liver abscess has been the operation of choice in Bengal during the last 10 years. In this series, 63 were males, one a female; 52 were Hindus, 11 Mohammedans, and 1 an Englishman. A history of dysentery was present in 44 cases, absent in 22; 35 patients were teetotallers. Their ages varied from 14-70, the average being from 30-40. Out of the total 64 cases, 49 were treated by aspiration alone, and of these 40 were cured and 9 died. The total death-rate for all methods amounts to 14 per cent. Taking the cases treated by aspiration alone, 28 were aspirated once with 4 deaths; 12 were aspirated twice with 3 deaths; 7 three times with 1 death, and one four times with a fatal result, and one five times with recovery. The largest amount of pus removed at any one aspiration was 96 ozs., the smallest 4 ozs.; with multiple aspiration the largest amount was 220 ozs. There were 35 lateral operations, 25 epigastric, and four in abnormal positions. Epigastric operations included both right and left lobe abscesses. In two cases there were multiple abscesses combined with extensive ulceration of the bowel.

Three unusual cases are recorded: in one the abscess pointed over the crest of the ilium, having tracked down from the extra-peritoneal surface of the liver; in another instance the abscess pointed in the right loin; the third patient expectorated liver pus on admission. Adequate treatment with emetine is as important as the operation. In uncomplicated cases the stay in hospital is a week or ten days.

An ordinary Potain's aspirator is used, general or local anaesthesia being employed. The site of the puncture is important, and should always be towards the *upper* surface of the abscess, particularly in epigastric cases. An abscess extending to the level of the umbilicus should be aspirated from above downwards from just below the costal margin, because, as the pus is being evacuated, the liver retracts with great rapidity. Two bottles should always be ready; when one is full it is replaced by the other, so that aspiration is continuous. The subcutaneous injection of emetine (grs. 2) should be effected directly aspiration is complete. With the emptying of the abscess cavity a negative pressure is set up and later an effusion of serum takes place into it; the object is to charge this serum with emetine to kill off the amoebae in the outer wall of the abscess.

Fifteen cases were treated by other methods; cases in which the abscess cavity has become secondarily infected should be drained at once. Nine cases were treated by incision, cleaning out the cavity with gauze, and primary suture; this is a useful procedure where the diagnosis is doubtful or the swelling in an abnormal position. No cases received emetine-bismuth-iodide, gr. v. to x. of emetine being considered ample.

P. H. M-B.

Townsend (R. S.). **Hepatosis (or Tropical Abscess of Liver): an Examination into the Diagnosis and Treatment of this Disease in India, with Especial Reference to the Use of Emetine.**—*Jl. Roy. Army Med. Corps.* 1924. Dec. Vol. 43. No. 6. pp. 401–421.

The old type of liver abscess which is diagnosed from great swelling of the liver or by evacuation through the lung is now seldom seen, especially in the Army, owing to the universal use of emetine in the treatment of inflammatory diseases of the liver. Unfortunately, despite the most effective treatment of dysentery, the mortality rate of liver abscess, as shown in the Army Returns, is still 25 per cent. The age incidence is from 20–40, and the author estimates that it is much rarer in women than in men than the proportion 1 to 20 usually stated. In Army statistics for the last 10 years there are records of this condition in three officers only; the British soldier is more commonly affected. With regard to race the proportion of 1–6 between the Indian Army and the British garrison in India is about correct. The subject of liver abscess in India may be divided as follows over a period of the last 100 years:—

(1) The period before 1870, when ipecacuanha was not in general use and operation was performed only upon obvious swellings.

(2) The period between 1870 and 1900, in which operations were more frequently performed and ipecacuanha was coming into use as the routine treatment for amoebic dysentery.

(3) The period 1900–1919, when ipecacuanha and emetine constituted the recognized form of treatment, and recourse was had to immediate operation on diagnosis.

No part of India seems to be immune from liver abscess, and no station appears to have ever had an epidemic. No place is particularly mentioned in the Army reports, save Secunderabad, from which the largest number reported was five in one year. The author has never seen an amoebic liver abscess secondarily infected. The pus is the

result of hepatolysis, not of suppuration. The author regards an increasing leucocytosis in a hepatitis under emetine treatment as a sure sign that hepatolysis is taking place. Signs and symptoms can be classified under three headings : —

Type (1), where there is an obvious liver swelling in right hypochondrium.

Type (2), when the liver is enlarged and shows signs of swelling over the right lobe, indicated by bulging of the intercostal spaces or well-marked signs of pleurisy.

Type (3), acute cases without any marked enlargement of the liver, but with definite signs of inflammation.

The patient who has an abscess in the right lobe of the liver usually takes up a characteristic attitude in bed ; he lies on his back or on the affected side with legs flexed. Shoulder pain is present in about 40 per cent. of cases. X-rays give disappointing results in diagnosis, being only positive generally when other signs and symptoms clearly point to liver abscess. In the *pre-suppurative stage* there is fixation of the diaphragm, with increased respiratory movements. The prognosis of liver abscess pointing into the hypochondrium is very good ; the author has opened 14 cases by this route, and has had 13 recoveries. One case is cited in which an abscess of the left lobe of the liver was diagnosed and pus obtained after nineteen attempts at aspiration. Malignant disease of the liver and tuberculous caries of the spine may be difficult to differentiate from liver abscess.

As regards treatment, emetine should be given in adequate doses, one grain of the hydrochloride every 12 hours. Aspiration should be confined to small abscesses ; cases showing signs of large amounts of pus should be operated upon and drained. Resection of a rib is necessary for free drainage. It is extremely rare to find amoebic abscess and amoebic dysentery in the same person.

P. H. M-B.

CLELAND (J. B.). **Amoebic Dysentery with Abscess of the Liver, Subphrenic Abscess and Purulent Pericarditis.**—*Med. & Scientific Arch. of the Adelaide Hospital. No.* 3. (*Supplement to the Ann. Rep. Adelaide Hospital for the Year 1923.*) pp. 38–39.

The amoebiasis appears to have been contracted in Australia. The patient was sent into hospital with the diagnosis of perforated gastric ulcer and a history of indigestion of five weeks' duration. At autopsy a large amoebic ulcer was found in the caecum, and below the attachment of the pericardium to the diaphragm a large abscess between the left lobe of the liver and the diaphragm communicating with a similar one in the upper portion of that lobe. Although death had occurred 36 hours previously, a motile *Entamoeba histolytica* could still be demonstrated in the wall of the abscess cavity. It appears that infection of the pericardium had taken place from the subphrenic abscess and had given rise to a purulent pericarditis.

P. H. M-B.

PETRIDIS (Pavlos A.). **Le traitement chirurgical de l'abcès tropical du foie.**—*Presse Méd.* 1924. Nov. 12. Vol. 32. No. 91. pp. 895–897. [9 refs.]

The Greek Hospital in Alexandria has treated more cases of liver abscess than any other similar institution in Egypt. The records

kept by Aristide PETRIDIS, father of the present author, show over 600 cases of liver abscess treated from 1896 up to 1922, and a greatly decreased number from the year 1914 onwards. The essence of the treatment is early recognition and prompt action. All authorities are agreed that failure to demonstrate pus by exploratory aspiration does not negative the existence of liver abscess. Aspiration, however, is not entirely free from danger as fatal results have been recorded. This consideration led Aristide PETRIDIS to practise polypleuro-diaphragmatotomy, a full description of which is here given.

P. H. M-B.

YING (Y. Y.). **A Case of Liver Abscess treated with Carrel-Dakin's Solution.**—*Nat. Med. Jl. China.* 1924. Oct. Vol. 10. No. 5. pp. 327–332.

The patient, a Chinaman, was admitted to hospital with many of the classical signs of liver abscess; there was a considerable degree of anaemia, but no leucocytosis. Aspiration through the seventh intercostal space yielded a litre of thick, malodorous pink-coloured pus. Five days later a further 500 cc. were sucked out. Operation was performed ten days after admission. A large metal cannula with an inside diameter of 1·5 cm. was introduced into the wound without resecting a rib and through this the abscess cavity was irrigated with Carrel-Dakin solution, 10 cc. every two hours. As healing took place the cannula was gradually forced out and finally dropped out on the twenty-third day after the operation. A rubber tube was then inserted and irrigation with the solution continued till forty-three days after the operation.

P. H. M-B.

HODSON (V. S.). **Amoebic Hepatic Abscess treated with Emetine only.**—*Lancet.* 1924. Dec. 20. pp. 1275–1277. With 1 chart. [11 refs.]

This paper is to a great extent a résumé of recorded cases of liver abscess in which a cure was effected, not by operative interference, but by emetine therapy alone. There are many points of analogy between a hepatic abscess and a gumma, but no one would justify operation upon the latter. Two further cases are here recorded (see this *Bulletin*, Vol. 18, p. 38; Vol. 19, p. 330). The first had already suffered and recovered from an amoebic hepatic abscess and was one of those previously recorded. It was presumed that the second abscess had arisen *de novo*. The diagnosis of liver abscess was obvious. After the first injection of gr. 1 of emetine the abscess burst through the lung. The second case had been ill for a long time, was anaemic and obviously very ill. A complete cure took place after 8 grains of emetine.

In conclusion it is urged that, since it has been conclusively proved that even a large amoebic hepatic abscess can be entirely absorbed after emetine treatment, surgical measures of all kinds should no longer be regarded as necessary until emetine has been properly tried. The analogy with gumma and tuberculous abscess is obvious, as when once the cause has been removed the absorption of the more or less fluid contents offers no difficulty.

P. H. M-B.

PAPPALARDO (Concetto). **Sull' uso dei clisteri di emetina nel trattamento dell' epatite amebica colliquativa.**—*Riforma Med.* 1924. Nov. 3. Vol. 40. No. 44. pp. 1036–1039. With 3 text figs.

The case is recorded of a man, 18 years of age, with hepatic abscess, in the pus of which, removed by exploratory puncture, amoebae were found; *Entamoeba histolytica* were also present in the faeces. Rectal injections of emetine (11 were given in 12 days), starting with 3cgm. in 100 cc. of thin agar solution with 20-30 drops of Tr. Opii, and increasing until 10 cgm. were given in a dose, resulted in the disappearance of all pain by the fourth day. 57 cgm. were given in all and no amoebae were seen subsequently, though the faeces were examined repeatedly for the four weeks during which the patient remained in hospital.

H. Harold Scott.

BAX (W. F.). **Die Therapie der Amöbiasis mit Yatren.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28. No. 11. pp. 479–483.

——. **De Therape der Amoebiasis met Yatren.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 1. pp. 13–18.

The results obtained by the use of yatren purissimum, No. 105, have been very satisfactory. Permanent cure in intestinal amoebiasis is a desideratum. Too often it has to be recorded that after an apparent cure a relapse takes place directly the patient returns to the East Indies. In hospital practice exact methods can be instituted for examining different portions of the intestinal contents for cysts by the utilization of a concentration technique. The patient should be put to bed, and while lying on his right side be given a large enema. The faeces are passed in several portions which are then examined and concentrated by Rodenhuis' technique. 1 cc. of faeces are placed in a 100 cc. flask together with 30 cc. of the following :—

Cupric chloride ($CuCl_2$ $2H_2O$) } Cupric acetate ... ... }	āā	600 mgm.
Formol		30 cc.
Aq. camph.		150 cc.
Aq. dest.		420 cc.
Ac. glacial acet.		4 cc.

Simple agitation is sufficient to emulsify in the case of soft motions. After centrifuging for 3 minutes the sediment is microscopically examined. 25 cases have been treated with yatren and controlled in this manner. The drug is given in 3 gm. doses daily in cachets for 10 consecutive days. The patient should be in bed on a milk diet, and in seven days' time receive a second course. The results are as follows : In 10 cases the author was satisfied that the amoebae were completely eradicated ; six cases were controlled for one year ; he concludes therefore that 16 were permanently cured. Five cases have been under observation for six months and are apparently cured. Of the remaining five, two have not appreciably improved. These results compare favourably with those obtained with emetine-bismuth-iodide and ipecacuanha. It is therefore certain that in yatren we possess a distinctly active drug for amoebiasis. The drug produces a painless diarrhoea of 3–6 motions a day. Probably it will be better to associate it with emetine.

P. H. M-B.

HUPPENBAUER (Carl). **Ueber einen Fall von 17 Jahre alter aktiver Amöbenruhr und seine Heilung durch Yatren per rectum.** [A Case of Amoebic Dysentery of 17 Years' Duration and its Cure by Yatren given by Rectum.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 51-55.

This is the record of a case of chronic intestinal amoebiasis treated by rectal injections of yatren administered by an apparatus known as the "Enterokleaner," which is described as a subaqual "Darmbad." This original method is particularly suited to the treatment of all chronic infections of the large bowel.

The case described in detail was a patient of 53 years of age who contracted amoebic dysentery in 1906 whilst on service in South West Africa, and had suffered ever since from dysenteric diarrhoea. After the failure of other known remedies, yatren was commenced at first by the mouth, four times daily in 0·25 gm. pills; for 14 days it was injected into the rectum in doses of 2 gm. daily, and on five occasions it was given as a "Sudabad" (i.e., 2 gm. yatren to 20 litres of solution). The stools became solid on the tenth day of yatren treatment and no more amoebae or cysts were found. The patient's weight rose from 70 to 81·5 kilogrammes within 83 days. The author considers that yatren itself, quite apart from other factors, was responsible in bringing about this remarkable change. The patient returned to active employment, and when last seen in September, 1924, his general health and physical improvement had been well maintained.

[The subaqual "Darmbad," on the model of Brosch-Olpp, is an apparatus with narrow inlet and broad outlet with which it is possible to wash out the bowel with 30 litres of fluid while sitting in a comfortable "Sitzbad."]

P. H. M-B.

FLANDIN (Ch.). **Le dérivé formylé de l'acide méta-amino-para-oxy-phényl-arsenique (tréparsol) dans le traitement de l'amibiase.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Nov. 27. Year 40. 3rd Ser. Vol. 48. No. 34. pp. 1628–1636.

In order to reinforce the action of emetine in resistant cases of dysentery RAVAUT advocated the use of arsenobenzene compounds, which given by the mouth are more efficacious than by the intravenous route. Latterly, stovarsol has been found to exert a specific action upon the intestinal lesions. A new compound, meta-amino-para-oxy-phenyl-arsenic acid, known as tréparsol, contains 28·75 per cent. of arsenic, as compared with 27·2 per cent. in stovarsol. Tréparsol is eliminated by the urine and is excreted in a regular manner commencing immediately after administration. It is decomposed in the intestines and then exerts a direct action upon the parasites and a general tonic action upon the body. In acute amoebic dysentery tréparsol alone rapidly causes amelioration of the symptoms and disappearance of the parasites; combined treatment with emetine injections is, however, more advisable.

During the acute stage tréparsol is given in tablet form in 0·25 gm. doses twice daily, during convalescence in larger doses of four tablets daily or 1 gm. It is claimed that the drug has a specific action upon Lamblia and Trichomonas, as well as upon ascaris and the ankylostomes. The author believes that in tréparsol we possess the most active

arsenical compound for the treatment of amoebic dysentery. Seven illustrations are quoted from the author's practice and a number of others from the records of his colleagues.

P. H. M-B.

SULDEY (E. W.). **Dysenterie amibienne spontanée chez le chimpanzé** (*Troglodytes niger*).—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 771–773. [5 refs.]

A captive chimpanzee, aged three years, had suffered from acute dysenteric symptoms for three weeks; 15-20 blood and mucus stools were passed daily. There was slight fever. Examination of blood-stained mucus revealed active amoebae with ingested red blood corpuscles and the characteristics of *Entamoeba histolytica*. Eggs of *Strongyloides fülleborni* and numerous Blastocysts were present in the same specimen. Probably the chimpanzee is as susceptible to amoebic dysentery as is man, and is infected through the alimentary tract by eating soiled vegetables or fruit.

P. H. M-B.

WAGENER (Edna Hannibal). **A Precipitin Test in Experimental Amoebic Dysentery in Cats.**—*Univ. California Public. Zool.* 1924. Jan. 26. Vol. 26. No. 2. pp. 15–20. With 1 plate. [3 refs.]

The liability of infections with *Entamoeba histolytica* in man to run a chronic course suggests that no complete protective immunity is developed. A search for a specific antigen was undertaken. For this purpose a strain of *E. histolytica*, after passage through 30 cats, was selected. The heart's blood was taken from a cat moribund from amoebic infection and used for serological tests. In preparing the antigen scrapings from the ulcerated surface of the bowel were placed in Coca's extracting fluid (0·5 per cent. NaCl, 0·05 per cent. Na_2CO_3 and 0·4 per cent. phenol). The fluid was then covered with toluol, the scrapings permitted to autolyse for one week, and the whole filtered through hard filter paper. Twenty-seven specimens of cats' blood have now been tested for their antigen content. Seven cats with acute amoebic dysentery gave a strongly positive precipitin reaction in a 1 : 4 dilution with amoebic antigen, those ill for less than 8 days gave a weakly positive reaction with undiluted serum only, while those which died in less than six days gave negative tests. One animal which recovered from the infection also gave a negative test. The results in amoebiasis are therefore analogous to those observed in bacterial infections. Controls with extracts from the colon of a normal cat were negative.

P. H. M-B.

EGUCHI (Churoku). **Ueber die verschiedene Empfänglichkeit junger und erwachsener Individuen für Infektionen. II. Mitteilung. Versuche mit Mäusetyphus und Amöbenruhr.** [The Varying Susceptibility of Young and Adult Individuals to Amoebic Dysentery.]—*Ztschr. f. Hyg. u. Infektionskr.* 1925. Jan. 10. Vol. 104. No. 1–2. pp. 241–249. [6 refs.]

It is a matter of clinical observation that children and adults withstand different infectious diseases in a totally different degree. The author put the matter to the test by feeding mice with the organism

of mouse-typhoid (TOPLEY'S strain). All young mice fed with 1-millionth part of a culture died, whereas the adult animals tolerated one hundred times the dose. Guineapigs of 1-3 days old, too, died after feeding with 1-10th and 1-100th part of the culture, whereas the adult could withstand a complete culture with impunity. Young cats can be infected in a high percentage with cysts of *Entamoeba histolytica*; in the experiments 40 per cent. developed dysentery, and one a typical liver abscess; whereas of the older animals, over 500 gm. in weight, only 8·6 per cent. became infected. These observations indicate that the mucous membrane of the young animal is deficient in protective bodies, while the adult animals have developed a high degree of immunity to infection *per vias naturales*.

P. H. M-B.

BACILLARY DYSENTERY.

LEFROU (G.). **Rapport sur une épidémie de dysenterie bacillaire en A.E.F.**—*Revista Méd. de Angola* (No. especial 1ᵉ Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a Sessões). 1923. Aug. No. 4. pp. 471–494. With 2 folding maps. [1 ref.]

In the French Middle Congo an epidemic of bacillary dysentery raged during 1922, being especially severe in the district of Mouyonzi-Kimboto. The death rate, though not exactly known, was estimated at 20 per cent. of the total population, the case-mortality in those who were isolated at between 20 and 25 per cent. Further investigations showed that such epidemics are not of infrequent occurrence, for in 1921 the district of Sibiti was decimated by an equally severe one. Its spread amongst the natives is attributed to close contact and to the presence in their midst of carriers of dysentery bacilli. The disease broke out subsequent to the return of a caravan from the Belgian Congo. In the Mouyonzi district from August, 1922, to January, 1923, the total number of deaths attributable to dysentery was returned as 3,126. No evidence was obtained that the spread of the epidemic was attributable to water or to the agency of flies. House infection was a noticeable feature, and is to be expected in view of the primitive habits of the natives. The tribal relationships are also of importance, for the disease appeared to spread with great rapidity when once introduced amongst members of the same tribe. Prophylactic measures are very difficult to enforce among a primitive people on account of their tendency to conceal cases of illness. Special efforts were made to isolate and treat the sick. Antidysenteric serum arrived in March, 1923. For an adult average doses of 40-60 cc. appear to have little effect; in order to obtain any lasting therapeutic action at least 80 cc. must be injected daily, but even 100 cc. or more appear to have little effect upon septicaemic cases. Expense is a great bar to more extensive employment of serum therapy (in the Colony 10 cc. costs 4 francs 50). The total amount of serum given in individual cases was a very large one; in two recorded it was 400 cc. For the relief of pain it was customary to give opium.

Prophylaxis.—3,000 doses of antidysenteric vaccine were issued, and were applied to the most heavily infected region of Sibiti, where 1,937 natives were inoculated. For adults, 1 cc. was given at the

first and 2 cc. at the second inoculation. For children, the dose was one-half or one-quarter. No general or local reaction was noted. No results were recorded. The only rational prophylactic and hygienic measure is to transplant the villages a short distance from the highly infected soil on which they stand; fifteen were so treated. Screen-latrines, which were put up by natives in accordance with orders issued, proved complete failures, as they were not used for the purpose for which they had been erected.

P. H. M-B.

DIEHL (Karl) (unter Mitarbeit von Alfred KRAUSE). **Wirbelsäulendeformierung eine Folge von Dysenterie.** [Spinal Curvature a Sequel of Dysentery.]—*Deut. Arch. f. Klin. Med.* 1924. Nov. Vol. 145. No. 5/6. pp. 322–325. [33 refs.]

The patient, who had served as a nursing sister in the war, contracted a Shiga-Kruse dysentery at the end of August, 1917; in November of that year signs of spinal curvature became apparent, and the pain thereby produced became very severe towards the end of the year. In May, 1922, a high degree of kyphoscoliosis was noted; her blood serum agglutinated Shiga's bacillus 1 : 200, and there were signs of a chronic ulcerative colitis.

The author is of the opinion that a chronic osteomyelitis of dysenteric origin was the cause of the spinal curvature.

P. H. M-B.

VAN NITSEN (R.). **Traitement de la dysentérie bacillaire par vaccinothérapie.**—*Bull. Méd. du Katanga.* 1924. Dec. Vol. 1. No. 6. p. 252.

The author considers that vaccine treatment of chronic bacillary dysentery is hardly to be recommended. A vaccine composed of equal quantities of Shiga's bacillus and a Y bacillus, isolated at Katanga, was given during 1921–1922 to a series of 66 cases in doses of 125 millions, then 250 millions, and subsequently in 500 million doses. In a group of 39 treated by vaccine alone the mortality rate was 25 per cent.; in a second series treated by medical measures as well it was 14 per cent.

P. H. M-B.

LÜDKE (Herm.). **Zur Kenntnis des Dysenterietoxins.**—*Deut. Med. Woch.* 1924. Nov. 14. Vol. 50. No. 46. p. 1569. [6 refs.]

The toxaemia of bacillary dysentery is somewhat similar to that of diphtheria and cholera; in the first the disease process is limited to a specialized part of the intestinal canal, whence the toxins are absorbed into the blood-stream; it is, in fact, a *toxicosis*. The bouillon-filtrate of the Shiga-Kruse bacillus is very toxic, so that 0·05–0·1 cc. is fatal to rabbits. The highest percentage of toxin is contained in a broth culture incubated for 2-3 weeks. The author's selected strains of Shiga-Kruse bacilli varied greatly in toxicity, the lethal dose ranging from 0·2 cc. to 6 cc.

P. H. M-B.

Lesbre (Ph.) & Verdeau (André). **Quelques particularités de l'anatoxine dysentérique.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 165–167. [1 ref.]

A dysenteric toxin was obtained by filtration from a three weeks' culture in Martin's bouillon of a Shiga bacillus whose toxicity had been increased by the collodion-sac method. Upon the addition of 3 per 1,000 formol and incubation for 20 days at 40° C., an *anatoxin* was obtained which was sufficiently attenuated to be tolerated by rabbits in doses of 2 cc. injected subcutaneously as a series of three injections at five days' interval. The ingestion by these animals, however, of 8 cc. on three occasions was followed by great emaciation and temporary paralysis. The anatoxin killed mice when injected in 0·5 cc. doses by the intraperitoneal route. Two rabbits were injected, one with 2 cc. of pure toxin, the other with the corresponding anatoxin with the addition of 6 per 1,000 formol; the latter died 36 hours before the former. The addition of 2 per cent. washing soda appears also to increase the toxicity. When the anatoxin is kept with 6 per 1,000 formol for 30 days in the incubator at 40° C. a stable anatoxin is obtained which cannot be further modified by the addition of formol or soda. Rabbits could be rendered immune to virulent cultures of Shiga's bacillus by inoculation of this second anatoxin. In 1/2 cc. intraperitoneal doses it was well borne by mice. It is therefore apparent that a dysenteric anatoxin is capable of protecting not only against the corresponding toxin, but also against living dysentery bacilli.

P. H. M-B.

Schiff (F.). **Ueber alkoholische Typhus- und Ruhrdiagnostica.**—*Klin. Woch.* 1925. Feb. 5. Vol. 4. No. 6. p. 285.

Typhoid bacilli contain, according to Schiff, two distinct antigens, one derived from the flagella, the other from the body-substance of the bacteria. The former is very susceptible to various influences; the latter is very stable and retains its antigenic properties after being extracted with alcohol. These antigens correspond with two different types of agglutinins—labilotrope and stabilotrope, according to the author. The labilotrope agglutinins are much more specific in typhoid than in paratyphoid infections, so that the differential diagnosis between typhoid and paratyphoid is much more easily made with fresh bacterial extracts. In the case of dysentery bacilli, which possess no flagella, only one kind of agglutinin—the stabilotrope—is formed in the serum. Alcoholic extracts of these bacteria are therefore eminently suitable for diagnostic purposes.

P. H. M-B.

Acél (D.) & Acél-Vécsei (Anna). **Ueber die "physiologische" Agglutination des Y-Dysenterie-bazillus.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Aug. 22. Vol. 92. No. 5/6. pp. 363–370. [7 refs.]

The authors first confirmed the observations of previous workers to the effect that serum of retroplacental origin agglutinates certain bacteria, *i.e.*, Flexner Y and *B. typhosus*, more frequently and to a greater extent than does that obtained from the umbilical cord of

the child; they then proceeded to demonstrate that the agglutinins in retroplacental serum are immune agglutinins and those in umbilical serum are normal agglutinins.

This they did by showing (1) that the avidity and absorbability of the agglutinins are less in the latter than in the retroplacental serum; (2) that the agglutinins of the retroplacental serum behave like immune agglutinins in being less sensitive to heat than those of the umbilical serum which thus resemble normal agglutinins; and (3) that, while absorption with an alien organism such as *B. paratyphosus B* removes all the agglutinins from the umbilical serum, it cannot remove any from retroplacental serum.

The authors regard these immune agglutinins of the retroplacental serum as physiological. Immune agglutinins can thus arise without any specific stimulus, and such agglutinins are incapable of passing through the placenta to the foetus.

H. Schütze.

Koose (Werner). **Zur Frage der Agglutination von Pseudoruhrbazillen durch Schwangerensera.** [Agglutination of Pseudo-Dysentery Bacilli by the Serum of Pregnancy.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Oct. 15. Vol. 92. No. 7/8. pp. 546–572. With 7 charts in text. [124 refs.]

The conclusion of the experiments here described is that "increased physiological" agglutination of pseudo-dysentery bacilli by the serum of pregnancy was not demonstrable by critical methods.

A. Alcock.

Hoder (Friedrich). **Vergleichende Untersuchungen von Coli-Dysenterie- und Paratyphusbakteriophagen.** [Comparative Investigation of Coli-Dysentery and Paratyphoid Bacteriophages.] *Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 424–436. With 4 figs. on 1 plate. [3 refs.]

From 17 different stools bacteriophages were isolated and tentatively determined. Four of them were identical with Shiga-bacteriophage and were designated δ-form. Other five were identical with Paratyphus bacteriophage and were designated B-form. One of them might be identified with Coli primary bacteriophage.

A. Alcock.

Eguchi (Chyuroku). [**On D'Herelle's Phenomenon. I. Communication. On Bacteriophage of Dysentery Bacillus.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. June. Nos. 339/340. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 301.]

The presence of dysentery bacilli seems to bear little relationship to the presence of bacteriophage. The strength of the bacteriophage is augmented by cultivation together with the live bacilli. It possessed a marked specificity against the dysentery bacillus, but some strains had a similar effect upon the typhoid and colon bacilli. The bacteriophage itself can resist a higher temperature than the dysentery bacilli, and can be precipitated and desiccated by acetone at a low temperature. A bacillary emulsion treated with bacteriophage becomes transparent; if it is then centrifuged and washed with broth several times bacteriophage

will still be present, but if saline be used it disappears at once. This is due to the absence of albumin, which seems to be necessary for the production of bacteriophage.

P. H. M-B.

Kojima (Katsumi). [**Experimental Studies on Bacteriophage. I. Communication.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. Jan. Vol. 18. No. 1. Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 297.]

In some cases of dysentery the author demonstrated a very strong bacteriophage, but the thermostability differed with each strain; some withstood heating at 85° C. for half an hour, but others were destroyed by 100° for five minutes. In some simple diarrhoeas and in typhoid fever the author demonstrated the bacteriophage; its activity was weakened by 0·5 per cent. phenol. The reactions of the medium appear to influence its activity to a great extent; alkalinity appeared to increase it, acidity to retard.

P. H. M-B.

Kojima (Katsumi). [**Experimental Results on Bacteriophage. II. Communication. Studies on Bacteriophage. III. Communication. On Anti-Bacteriophage Action of Bacteria and on the Mutation of Bacteria by Bacteriophage.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. Mar. & June. Vol. 18. Nos. 4 & 7. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 299.]

The antibacteriophage strain of dysentery bacillus showed marked morphological and immunological changes from the normal. Many other strains underwent no such changes.

P. H. M-B.

Yoshimoto (S.). **Experimentelle Untersuchungen ueber den durch parentrale Injektion von Proteine (besonders Kasein) bei Kaninchen hervorgeruhenen unspezifischen bacillären Immunkörper. (I. Mitteilung).** [Investigation of Non-Specific Bacillary Immune Body resulting from Parenteral Injection of Protein, especially Casein in Rabbits.]—*Scientific Reports from Govt. Inst. for Infect. Diseases.* Tokyo. 1923. Vol. 2. pp. 139–140. [Autoreferat.]

The author made the remarkable observation that casein-serum (that is, immune serum produced by injecting rabbits with casein) acts upon dysentery bacilli in the same manner as authentic immune serum. The substance was injected intravenously into rabbits in 1 to 4 per cent. solution in distilled water on a water-bath. The dose was 1-2 cc. per kilogramme of body weight. Injections were repeated at 7-day intervals for a series of four. The resulting casein-serum does not act on other organisms than the dysentery bacillus.

P. H. M-B.

Adachi (Kiyohisa). [**On the Classification of** *Bacillus dysenteriae*].—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1924. Aug. No. 2382. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 326.]

Adachi considers that all the dysentery bacilli may be grouped into the following three groups :—

A Type, including Shiga's bacillus.

B type, including Hiss' bacillus, Flexner's bacillus and allied strains.

C type, including the author's "Ohara strain."

P. H. M-B.

KASAI (Keijiro). [**Catalase Reaction of *Bacillus dysenteriae*, together with a New View on the Classification of the Dysentery Bacilli.**]—*Iji-Shimbun* (*Med. News*). 1924. July. No. 1143. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. p. 261.]

The author attempted to classify dysentery bacilli by the catalase reaction and divided them into the following groups: *B. dysenteriae*, Shiga-Kruse; *B. paradysenteriae* A, Y & F (Flexner); *B. paradysenteriae* B, Ohhara, Minoda and other strains.

P. H. M-B.

WATANABE (Kohei), HASEGAWA (Kamenosuke), NAKAMURA (Shinro), KOHNO (Yuji) & KAWAGUCHI (Itsu). [**On the Types of Dysentery Bacilli which cause Epidemics of Dysentery in Tokyo.**]—*Igaku Chuo Zasshi* (*Central Jl. of Med.*). 1924. Aug. Vol. 22. No. 2. p. 330. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 330.]

The authors investigated 286 strains of dysentery bacilli collected from cases in Tokyo and classified them after FUTAKI's method :—

77·1 per cent. belonged to Komagome B type.
21·7 per cent. ,, ,, A ,,
1·05 per cent. ,, Shiga type.

P. H. M-B.

TANAKA (Iwawo). [**On the Strain of Dysentery Bacillus, which does not decompose Mannit.**]—*Jikken Igaku Zasshi* (*Jl. of Experim. Med.*). 1924. Apr. Vol. 8. No. 4. [Summarized in *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 268–269.]

The author found 15 strains of dysentery bacillus (out of 106 cultures obtained from various laboratories) which do not ferment mannite; with these he deals at length.

P. H. M-B.

OH (Soki). [**Precipitin Reaction applied to the Typhoid and Dysentery Diagnosis.**]—*Eiseigaku Densenbyogaku Zasshi* (*Jl. of Hyg. & Infect. Dis.*). 1924. Apr. Vol. 19. No. 4. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 302.]

From experiments on a limited number of cases the author observed that an emulsion prepared from the faeces of typhoid and paratyphoid A and B formed a precipitate if brought into contact with a homologous serum and gave a negative result with control serums. Faecal infusions from dysentery cases did not give such a clear-cut reaction as did those of typhoid.

P. H. M-B.

KAWAMURA (Hideku) & TSUCHIYA (Kinichiro). [**On the Estimation of the Efficacy of Dysentery Serum. I. Communication. Preparation of Dysentery Toxin and its Serological Test.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. June. Nos. 339/340. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 301.]

After 2-3 hours cultivation of dysentery bacilli in broth, a gradual increase in acidity was noted and the maximum reached in 6-7 hours. After one or more days the hydrogen-ion concentration was seen to fall gradually and the medium becomes alkaline until the maximum—pH 8·6—is reached. Shiga bacilli showed marked constancy in this respect. The virulence of the bacillus increases relatively to the increase of alkalinity and the maximum alkalinity corresponds with the maximum toxicity.

P. H. M-B.

Mixed and Unclassed Dysentery.

Bolton (J. Shaw) & McGrath (M. J.). **Asylum Dysentery and Allied Infections (Fifth Post-War Report).**—*Tenth. Ann. Rep. of the Board of Control for the Year 1923. Lunacy & Mental Deficiency.* pp. 79–81. 1924. H.M. Stationery Office.

The studies on the duration of agglutination produced by inoculations are completed in this report. The net result goes to show that agglutination indicates a vital reaction on the part of the subject, not merely a chemical one, and its titre and its duration depend more upon the idiosyncrasy of the animal than upon the dose or the nature of the emulsion.

The serum of a Flexner-injected animal agglutinates more easily than the others, the animal can withstand a maximum dose, and maintains a moderate titre for months afterwards.

During the year no dysentery or enteric bacillus has been isolated at autopsy, while a noteworthy decrease in less pathogenic organisms such as Morgan I and *Bacillus faecalis alkaligenes* has taken place. The authors regard an agglutination titre of 1/50 and 1/100 as constituting a safe diagnostic standard. In the case of typhoid injections, a positive agglutination means a present or relatively recent attack of the disease. On the other hand, in the case of the dysentery group, whenever one or more cases are found, numerous contacts also give positive agglutination.

P. H. M-B.

Watson (G. A.). **Dysentery.**—*Tenth Ann. Rep. of the Board of Control for the Year 1923. Lunacy & Mental Deficiency.* pp. 81–82. 1924. H.M. Stationery Office.

At the Rainhill Mental Hospital a smaller number of cases of dysentery was recorded in 1923 than for many years past, and those were sporadic and of a mild type. For the first time for over 20 years no deaths were attributable to this disease. The total number of cases was 20, 13 males and 7 females. In 2 males and 1 female active forms of *Entamoeba histolytica* were found, in 8 males and 5 females Flexner's bacillus, in 3 males and 1 female Strong's bacillus. In addition, there were 10 patients who suffered from colitis with blood and pus, from whom no pathogenic organism was isolated. 146 individuals, mostly those who had in previous years suffered from dysenteric attacks, were examined: one was found to be excreting cysts of *E. histolytica*. No carrier of the dysentery bacillus was discovered.

P. H. M-B.

Müller (J.). **Zur Klinik und Therapie der Dysenterie im Säuglings- und Kindesalter.** [Symptoms and Treatment of Dysentery in Infants and Children.]—*Arch. f. Kinderheilkunde.* 1924. Vol. 74. No. 2/3. pp. 115–129. [19 refs.]

Under the heading of dysentery in infants and children it is necessary to include a number of mild infections which do not exhibit the symptom-complex of bloody stools, abdominal pain and tenesmus. Conditions such as abdominal tuberculosis, intussusception, intestinal polypi, prolapse of the bowel and anal fistula may simulate true dysentery very closely indeed. A slimy bilious stool, or a massive evacuation containing small flecks of mucus and blood, is suggestive

of dysentery, though it is not unusual for blood and mucus to be absent altogether. The causative organism is not always easy to demonstrate, but in favourable cases it can be isolated in 50 per cent. The agglutination reaction also is unreliable, especially in children; under six months of age no reaction can be expected; in older infants it does not appear for 2-3 weeks. For positive diagnosis a titre of 1 : 200 is necessary.

Bacillary dysentery is a disease of warm weather. The incidence in Düsseldorf during the summer of 1923 commenced in June and reached its maximum in August and September (138 out of a total of 179), when the death rate, 25, was highest. The rapid spread of the disease, especially in the poorer overcrowded quarters amongst members of the same family, was very noticeable.

One of the toxic manifestations of dysentery is seen in the stimulation of the vagus, resulting in slowing of the pulse-rate, intestinal colic and tenesmus, and probably also failure of the gastric secretion and the vomiting so often observed in children. Atony of the bowel rarely occurs. The toxic effect upon the sympathetic system is seen in the vasomotor instability. In mild cases the symptoms of intestinal toxaemia alone are apparent, the nervous manifestations being altogether absent (81 out of 148 cases belonged to this category). Relapses may take place and prove fatal. In the mild form convalescence is usually complete within 8-10 days. In the more serious form there is a more noticeable disturbance of health; blood and mucus stools persist for 10-20 days; nervous manifestations are present, while convalescence is not complete for 3-4 weeks. Forty-eight cases were included in this series; there were no deaths and no relapses. The really acute cases commence suddenly and symptoms of toxaemia soon manifest themselves. Hydraemia rapidly takes place. Pyrexia is usually present. Six of these cases were observed, and all ended fatally within four days. The infecting organism was in each instance the Shiga-Kruse bacillus. When the higher nervous centres are affected so as to produce delirium or coma the outlook is very unfavourable. On the whole, delirious cases run a more favourable course than those with stupor. The mortality in Shiga-Kruse infections was 9 out of 72, as compared with Flexner infections, 1 out of 6. In small infants the disease generally runs a very mild course; a few slimy stools and mild degree of pyrexia may be the sole symptoms noted. As regards prognosis, the death-rate was found to be highest during the first year of life; 6 out of 26 deaths were noted from 1 to 2 years; after that, up to the age of 11 years, the numbers gradually decreased.

The author has little to say on the subject of treatment. Anti-dysenteric serum, on account of the frequency of serum-sickness, he has long since abandoned.

P. H. M-B.

HAUGHWOUT (Frank G.). **Some Departures from the Typical Cell Picture of Bacillary and Amoebic Dysentery, with Speculations as to their Significance. I. Observations on some Post-Bacillary Exudates, and on the Presence of Eosinophiles in Intestinal Allergy.**—*Philippine Jl. Sci.* 1924. Oct. Vol. 25. No. 4. pp. 513–537. With 8 plates. [7 refs.]

In the microscopic study of the faeces in subjects of bacillary dysentery we have to deal with two distinct cell pictures. Firstly, that presented by the more or less regressive cytological changes

characterized by a decline in the number of endothelial macrophage cells and evidences of toxic necrosis in cells of all types; secondly, the expression of a residual purulent process in unhealed areas of the colon in which *B. dysenteriae* plays little, if any, part. In the latter stage the annular degeneration of the leucocyte nuclei becomes less marked, and they tend to regain their usual lobed and homogeneous appearance. This stage, in some instances, is succeeded by a desquamative process in the colon in which large numbers of columnar epithelial cells are cast off. The author does not believe that chronic bacillary dysentery is of frequent occurrence. The chronic processes following acute bacillary dysentery are caused by organisms or conditions bearing no relation to the activities of the dysentery bacillus.

There are two general types of exudate in amoebic dysentery. One is almost devoid of cellular elements and, apart from the entamoeba, is usually seen in the first attacks of amoebic dysentery, and signifies that there is little secondary bacterial infection of amoebic ulcers. The second is the characteristic stool of chronic amoebic dysentery and the evidence of secondary bacterial infection of amoebic ulcers is afforded by numerous polymorphonuclear leucocytes.

P. H. M-B.

MARCHOUX (E.). **Action du Stovarsol sur le parasitisme intestinal.**—*Paris Méd.* 1924. Nov. 22. 14th Year. No. 47. pp. 421–426.

The author gives a considerable list of authorities besides himself who have used stovarsol with great success in the treatment of amoebic dysentery, and in some instances giardiasis and balantidiasis, and he now reports some more results of its remarkable utility.

Of 59 cases of intestinal amoebiasis—mostly old cases that had already suffered much and varied treatment—57 were cured by a course of stovarsol, the 2 incurable cases being also resistant to every other appropriate kind of treatment. In the successful cases cysts or amoebae disappeared in two or three days, and recovery was complete in about a week—as judged by subsequent observation for six weeks. The duration of the stovarsol course was six weeks. For recent cases the course consisted of 0·5 gm. stovarsol daily for the first three weeks and 0·25 gm. daily for the last three weeks. For old chronic cases the course began with 0·5 gm. on the first day, increased to 1 gm. on the third and fourth days, then 1 gm. every second day until the eighth, then 0·75 gm. every second day for a week, reduced to 0·5 gm. for another week, and finally 0·25 gm. daily for three weeks. The drug was given in tablet form with meals. No special dietary was ordered; but tobacco, butter, and wine and fermented liquor were forbidden. And any concurrent dyspepsia was appropriately treated.

In 21 cases of giardiasis the symptoms and condition of the patient were always ameliorated, and in some cases the parasites disappeared quickly, but in others their disappearance was only temporary. The stovarsol course here was of the interrupted kind; it began with respective doses of 0·5 gm., 0·75 gm. and 1 gm. daily on the first 3 days, and continued with 1 gm. daily for the next 3 or 4 days; then an interruption for 4 days, then a repetition, and so on for 3 weeks.

Blastocystis, which, when it is extremely abundant, the author regards as causing irritation and diarrhoea, disappears completely after small doses of stovarsol.

Divers bowel complaints and attendant toxic neuralgias are relieved by stovarsol, which the author believes to act by activating the digestive ferments while sterilizing the waste products of their action.

A. Alcock.

JACOBI (Erich). **Erfolge mit Yatren bei Ruhr.** [Yatren Treatment of Dysentery.]—*Deut. Med. Woch.* 1924. Nov. 21. Vol. 50. No. 47. p. 1614.

Yatren (oxychinolin-sulphonic acid combined with 30 per cent. iodine) is specific for amoebiasis, but it is useful also for bacillary dysentery. For this purpose the drug is given in cachets, each containing 0·5 gm. of yatren. Four of them are given the first day, six on the three succeeding days, afterwards four. Altogether 40 cachets should be administered. No ill-effects have been noted. An illustrative case is cited of the success of this drug where such remedies as tannalbin, opium, bolus alba, etc., had failed. Yatren also appears to be successful in eradicating the dysentery bacillus from "carriers" of the infection.

P. H. M-B.

HINES (Laurence E.). **Kaolin in Chronic Dysentery.**—*Proc. Inst. of Med. Chicago.* 1924. Vol. 5. No. 1. pp. 63–66. [6 refs.]

Kaolin is a form of purified clay, and is composed essentially of hydrous aluminium silicate. Recently it has been credited with curative powers in intestinal diseases, especially cholera. In studies with BRAAFLADT kaolin was fed to white rats, dogs and normal men in order to study the consequent changes in the intestinal flora. Rats and dogs after a diet of 2 gm. of kaolin daily for 16 days developed a predominantly aciduric flora. A change from a proteolytic to an aciduric type of flora was observed in the stools of four healthy men. Kaolin also absorbs toxins. Kaolin was administered to 10 patients in a dose of 30 gm. of kaolin powder, emulsified in water, twice daily. The cases were of a varied description—such as tubercular enteritis, amoebic dysentery and mucous colitis. Of these, six who had definite ulcerative lesions of the intestines showed clinical improvement after taking kaolin, as manifested by the decrease of the diarrhoea and relief from abdominal pain. Two patients who had no evidence of intestinal ulceration also improved as the flora became more aciduric. The results suggest that kaolin does not produce an aciduric flora in chronic dysentery as readily as in normal men or laboratory animals. It seems that kaolin is worthy of a further trial in the treatment of chronic dysentery. [See also this *Bulletin*, Vol. 21, p. 395.]

P. H. M-B.

EVANS (Thomas Carey). **The Surgical Treatment of Chronic Ulcerative Colitis.**—*Brit. Med. Jl.* 1925. Jan. 31. pp. 204–205.

The medical treatment of chronic ulcerative colitis is extremely unsatisfactory. The majority of the cases of colitis seen by the author in Mesopotamia were chronic and complicated by scurvy, which as

a rule rendered the condition most intractable. Appendicostomy was performed in 10 intractable ulcerative cases—Turks, Arabs and Indians. After a few irrigations of the large intestine the patients began to show remarkable improvement. The immediate results were excellent, but it soon became obvious that lavage had to be persisted in for prolonged periods. A case is cited in which amoebic ulcerations were verified by the sigmoidoscope. As the patient was not doing well a valvular caecostomy was performed, No. 12 rubber catheter introduced, and the bowel washed out with saline. The final result was very satisfactory, the patient having increased 2 st. in weight. The author concludes that cases of colitis persisting two or three months without intermission and with profound emaciation and not responding to medical treatment should be handed over to the surgeon, since whatever the organism which caused the primary infection may have been they are, in this stage, examples of mixed infection. The only rational treatment, when the diagnosis is confirmed, is frequent irrigation of the large intestine, either through an appendicostomy or a valvular caecostomy, with eusol solution until the washings are clear.

P. H. M-B.

Hara (Minoru). [**On the Type of Fever in Infantile Dysentery and Ekiri.**]—*Iji-Shimbun* (*Medical News*). 1924. Sept. No. 1147. Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 329.]

In 70 per cent. of cases of infantile dysentery the body-temperature rose abruptly, but fell in 2-3 days from onset of symptoms; should the latter be severe it rises again on the 4th-5th day.

P. H. M-B.

Reicher (K.). **Zur Therapie der akuten und chronischen Dysenterie, Kolitis, Sigmoiditis und Proktitis.**—*Muench. Med. Woch.* 1925. Feb. 13. Vol. 72. No. 7. pp. 261–262. [16 refs.]

This paper extols the virtue of an extract of camomile, camillosan, in the treatment of dysentery and colitis, exhibited as a powder for rectal insufflation or in liquid form as enema.

P. H. M-B.

Le Noir (P.) & Deschiens (R.). **Infestations intestinales par *Trichomonas intestinalis* et entérites.**—*Arch. des Malad. de l'Appareil Digestif.* 1924. Dec. Vol. 14. No. 10. pp. 919–922.

Notes of 10 cases of colitis or dysenteriform diarrhoea associated with infestation by *Trichomonas intestinalis*, 2 of them complicated with *Entamoeba histolytica*, and 2 with *Giardia intestinalis*. In the six pure Trichomonas infestations the symptoms were constant or remittent diarrhoea (3 or 4 soft stools a day), colic generally localized about the sigmoid flexure, and loss of flesh; the stools contained mucus and mucoid lumps, and the flagellates were numerous in the mucus and liquid parts; in one instance ingested red blood cells were seen in flagellates. Essence of turpentine in a gummy vehicle was given to the three cases that stayed for treatment; two of them were

" ameliorated in 15 days " by this treatment, but in the third auxiliary lavage with protargol was necessary. The author emphasizes the significance of gum in treating these flagellate infestations.

A. Alcock.

ROUX (Jean Charles). **Note sur certaines entérites à flagellés** *Tetramitus mesnili.*—*Arch. des Malad. de l' Appareil Digestif.* 1924. Nov. Vol. 14. No. 9. pp. 836–839 (Discussion pp. 839–841). [2 refs.]

An interesting story of three cases of violent and inveterate diarrhoea, associated with enormous numbers of " Tetramitus " in the stools, two of which are stated to have been cured by an ingenious novel device. The circumstances appearing unfavourable to a trial of ESCOMEL'S treatment by iodine enemata and strong doses of turpentine, or of HEGNER'S suggested treatment by a diet of flesh, it occurred to the author to try the effect of " modifying the intestinal medium " by administration of mucilage. The patients were therefore given one to two teaspoonfuls of mucilage daily. Under this treatment the parasites became obviously encumbered and finally disappeared altogether in 1, 2 and 6 months respectively. After their disappearance ordinary treatment for the colitis was completely successful in one case and slowly successful in another, but in the third case was followed by a reappearance of the parasites after an interval of 15 days.

A. Alcock.

DOPTER. **La balantidiase (étude étiologique).**—*Ann. de Méd.* 1924. Oct. Vol. 16. No. 4. pp. 247–260. [72 refs.]

A full and uncommonly good account of the geographical distribution and etiological history of balantidiasis. It does not contain anything new, but it may be useful here to extract some particulars of the geography of the disease and the xenography of the parasite (*Balantidium coli*).

The disease is widely distributed in Europe, Asia, Africa, and America. In Europe the countries included in this record are Austria, Balkan States, Finland, France, Germany, Hungary, Italy, Norway, Poland, Russia, Sweden. In Africa ; Algeria, Morocco, and the Red Sea coast. In America ; the U.S.A., Central America and the West Indies, Brazil, Guiana, and Venezuela. In Asia ; Cochin China, India, Siam, Tonkin, and some of the islands of the Malay Archipelago.

The hosts in which the parasite has been found are, besides pig and man, captive apes and monkeys (orang, macaque, baboon).

A. Alcock.

DANISCH (F.). **Balantidiencolitis kombiniert mit Typhus abdominalis. Bemerkungen zur Biologie und pathogenen Bedeutung des** *Balantidium coli.*—*Cent. f. Bakt.* 1. Abt. Orig. 1924. June 16. Vol. 92. No. 1-2. pp. 104-115. With 4 text figs. [44 refs.]

A brief abstract of a fatal case, diagnosed clinically as typhoid fever and found afterwards to be that disease superposed upon a very fell infection of *Balantidium coli*, is followed by a prolonged description and discussion of the latter infection and its destructive effects upon the

colon and rectum. In the colon were seen numerous necrotic ulcers, ranging in size from a pea to a shilling, crowded or confluent, and eroding the coats of the gut almost to the perforation-point; similar ulcers, not so numerous and not reaching such a large size, existed in the rectum. In sections of the colon balantidia were found in the Lieberkühnian follicles, in the submucous and muscular coats, and even in the subserosa. The author discusses the pathogeny of Balantidium and concludes that the organism becomes pathological only when the contents of the large intestine—normally acid—become alkaline.

A. Alcock.

Nord (Folke). **Fall av balantidiumcolit behandlat med emetin.** [A Case of Balantidium Colitis treated with Emetine.]—*Hygiea.* 1924. Nov. 30. Vol. 86. No. 22. p. 826.

The patient was a man of 65. At the age of 40 he began to get periodic diarrhoea. He had 2 or 3 loose motions a day, sometimes attended by slight pain in the abdomen. The trouble gradually increased during the succeeding years, but latterly he had not usually had more than one motion a day until two months before admission to hospital, when his condition got considerably worse. He had more than one motion an hour both day and night, and occasionally drops of fresh blood were present. On admission he was ashy-grey in appearance. The faeces were greyish-brown, of the consistence of thick soup, foul-smelling, and contained a few *Balantidium coli*. Next day Balantidium was present in large numbers. The colon was washed out with solutions of tannic and acetic acid, and the condition speedily improved so that he could be discharged in about a month. The parasite disappeared from the faeces. He was taken into hospital again 8 months later for a relapse and large numbers of *Balantidium coli* were present. For the first three days he was treated as before but afterwards by subcutaneous injections of emetine, 3 cgm. twice daily. As there was little improvement in a week the dose was increased to 5 cgm. twice daily for 5 days, when the injections were stopped. From that time no more parasites could be found and the faeces remained formed. No other treatment except a suitable diet and rest in bed at first was given. A few months after discharge from hospital he was having one or two motions a day of normal consistence.

The emetine cured the patient in a relatively short time. Whether the parasite was really got rid of, it is not possible to decide at present, as the patient has not been observed for a sufficiently long time. There were no after-effects from the emetine injections and absolutely no discomfort.

E. E. Atkin.

i. Carruyo (Jesús). **Hepatitis supuradas tratadas con exito por el metodo de Rogers.**—*Rev. Med. y Cirug.* Caracas. 1924. Aug. 31. Year 7. No. 77. pp. 210–211.

ii. Mondolfo (Emanuele). **Focolai di amebiasi in Romagna.**—*Policlinico.* Sez. Prat. 1925. Jan. 19. Vol. 32. No. 3. pp. 85–87.

iii. da Cunha (Aristides Marques). **Diagnostico e tratamento da dysenteria amebiana.**—*Sciencia Medica.* 1924. Oct. 31. Vol. 2. No. 10. pp. 532–537. With 1 plate.

iv. Furutama (Taro). **On the Carriers of Amoeba-Cysts in Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*). 1924. Sept. No. 236. English summary pp. 3–4. [In Japanese.]

v. Houssiau (F.). **Diarrhées dues à l'Amaeba Coli.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 191–192.

vi. HEINEMANN (H.). **Zur Diagnose und Therapie der chronischen Amöbiasis.**—*Arch. f. Verdauungs. Krankht.* 1924. June. Vol. 33. No. 3/4. pp. 203–214.

vii. FIGDOR (Philip). **Treatment of Chronic** *Entamoeba histolytica* **Infection.**—*Jl. Clin. Res.* 1924. Apr. Vol. 10. No. 2. pp. 37–42.

viii. STRAUB (M.). **Amoebiasis penis (venerica !).**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 6. pp. 989–990. With 1 plate.

i. Two cases of suppurative hepatitis are briefly described, in one of which the abscess opened into the lung. Treatment by injections of emetine hydrochloride, 5 cgm. twice a day, and ipecacuanha by mouth was undertaken, and both were cured in a fortnight without operative measures.

ii. The author, after referring to two cases of amoebic dysentery in Cesena previously described, relates three more in the present paper to prove that the disease does undoubtedly exist in Romagna, a fact which some have denied.

iii. An item of possible interest in this paper is the statement that an extract of *Garcinia composita*, a plant of the order Clusiaceae, given in doses of 6-12 spoonsful daily in coffee for two days in acute cases, 3-6 daily for five days in chronic cases, is useful in the treatment of amoebic dysentery.

H. Harold Scott.

iv. An investigation of the percentage of amoeba "carriers" amongst apparently healthy people in Formosa was undertaken; 54 were examined, half Japanese and half Formosans.

E. histolytica cysts were found in 3·7 per cent; *E. coli* in 9·2 per cent; *I. bütschlii* in 3·7 per cent.; *E. nana* in 5·5 per cent.

v. Two cases of simple diarrhoea in children of two to three years of age are described and attributed to *Amoeba coli*.

vi. This paper is a résumé of the recent literature and contains no original observations.

vii. Contains no novel information.

P. H. M-B.

viii. After coitus per anum four years ago, a Chinese suffered from a relapsing inflammation of the penis. There was an ulceration of the glans penis, containing *Entamoeba histolytica*. The ulcer quickly healed under treatment with emetine injections and has not relapsed since.

W. J. Bais.

DUTTON (L. O.). **Technic for the Bacteriologic Diagnosis of Bacillary Dysentery.**—*Jl. Lab. & Clin. Med.* 1924. Apr. Vol. 9. No. 7. pp. 463–468.

FUJITA (Koshiro). **Ueber ein heterogenetisches Antigen in Shiga-Dysenteriebazillen.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil Orig. 1924. Dec. 10. Vol. 41. No. 6. pp. 539–556. [13 refs.]

IACONO (Igino). **Cura della colite amebica.**—*Riforma Med.* 1924. Dec. 1. Vol. 40. No. 48. pp. 1137–1138.

PETZETAKIS. **Amoebic Bronchitis and Frequent Presence of Live Entamoebae in the Sputum and Urine during Acute Amoebic Dysentery.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 1. Vol. 27. No. 7. pp. 74–75. [1 ref.]

SUZUKI (Tadashi), with TOKUYE (K.) & HATAI (K.). **De Verspreiding van Bakteriophagus in Dysentery-Faeces van Kinderen.**—*Jl. Oriental Med.* Dairen. 1923. Nov. Vol. 1. No. 4. pp. 137–140.

YU (Ilchum). **Vergleichende biologische, serologische und kapillar-chemische Untersuchungen an Varianten der Typhus-Paratyphus-Ruhr-Gruppe.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil. Orig. 1924. Nov. 25. Vol. 41. No. 5. pp. 393–430. With 1 text fig. [157 refs.]

SPRUE.

SMITH (Lawrence Weld). **The Rôle of *Monilia Psilosis* (Ashfordi) in Experimental Sprue. Including Mycologic Observations on Twenty-One Strains of Monilia.**—*Jl. Amer. Med. Assoc.* 1924. Nov. 15. Vol. 83. No. 20. pp. 1549–1554. With 5 text figs. [24 refs.]

This investigation was prompted by the discovery of *Monilia psilosis* in certain fatal cases of anaemia, in Manila, presenting the clinical picture of sprue. The strains of monilia were obtained from these cases and also those of ASHFORD from Porto Rico. Other strains were obtained in Boston from two sprue cases and from the large intestine of an infant who died of a persistent diarrhoea. The identification of Monilia was based on ASHFORD's criteria, viz.: the carbohydrate reactions, the "inverted pine-tree" appearance in gelatin, the growth on Sabouraud's medium, and the microscopic appearance of the yeast cells themselves. Specific complement fixation occurs for *M. psilosis* in animals, regardless of how immunization is attempted, but no such reaction follows injection with *M. albicans*; the latter is, therefore, non-pathogenic. Agglutination tests have been discarded as of no value. A table is given illustrating the more important cultural characteristics of the strains studied. According to ASHFORD, the carbohydrate reactions of *M. psilosis* are constant, but the author finds that old subcultures lose their ability to ferment carbohydrates with gas-production, though animal passage restores their fermentative reaction.

The production of mycelium represents the resistant stage of the organism and occurs only in old subcultures; this would explain the intermittent character of the symptoms in the early stages of the diarrhoea; the frothy motions accompany the yeast cell production, the remissions the mycelial phase. In the case of *M. psilosis* intraperitoneal injection of 2 cc. of a saline suspension of the organism into guineapigs is followed, some 48-72 hours afterwards, by the development of definite mycotic abscesses. Intravenous injection of 5-10 cc. produces a septicaemia in 24-72 hours, but *M. albicans* is far less virulent and may sometimes produce a septicaemia with lesions of the liver from which the organism may be recovered. After various attempts the intraperitoneal and intragastric method of inoculation were chosen as the best routes in monkeys. The latter was effected by the use of a catheter attached to a syringe whereby 10 cc. of a Monilia suspension could be introduced into the stomach. In five monkeys a moniliasis of the gastro-intestinal tract was induced which persisted for several weeks, and the organisms were recovered regularly from the stools. Four showed no symptoms save a temporary frothy diarrhoea. A fifth developed pyrexia and diarrhoea, death eventually taking place from bronchopneumonia. The Monilia was recovered from the ileum and colon. The mucosa of the intestines was moderately injected, and several small, superficial ulcers were found in which mycelium was demonstrated histologically.

Intraperitoneal inoculation of 24 guineapigs with *M. psilosis* produced a moniliasis which persisted from 8-12 weeks on the average. In two cases cultures were positive after five months. At autopsy of these animals definite lesions of the gastro-intestinal tract were demonstrated, as well as small aphthous ulcers of the tongue. On a scorbutic, vitamin-deficient diet composed of soy-bean, flour and butterfat

a series of 20 guineapigs was inoculated by the oral and intraperitoneal routes. The results were most suggestive ; a moniliasis of the gastro-intestinal tract ensued, and with *M. albicans* patches of "thrush" appeared on the tongue. Of 12 animals inoculated with *M. psilosis*, two recovered after 3-4 months of intermittent diarrhoea accompanied by loss of weight. The others died at varying intervals following inoculation, two in less than one week from generalized *M. psilosis* septicaemia. At necropsy of the remainder the pathological changes were striking and uniform. The lesions were found in the tongue, ileum and colon. The mucosa of the tongue presented white thrush-like membrane and small aphthous superficial ulcers ; in some of these penetration by mycelium was observed. In the intestine similar superficial ulcers were found in the terminal ileum and colon, especially in relation to the lymphoid structures. Examination of the blood never revealed a degree of anaemia comparable with that found in human cases of sprue in Manila. The pathogenicity of *M. psilosis* appears to be very slight, except in a suitable soil, which appears to be an avitaminosis, or a calcium deficiency dependent on excessive fat or protein dietary. These experiments support ASHFORD's claim for the specificity of *M. psilosis* as the chief causative factor in sprue.

P. H. Manson-Bahr.

ELDERS (C.). **Tropical Sprue and Pernicious Anaemia. Aetiology and Treatment.**—*Lancet.* 1925. Jan. 10. pp. 75–77. [12 refs.]

Since 1916 the author has been convinced that sprue is a deficiency disease. In many cases the blood picture cannot very well be distinguished from pernicious anaemia, nor can always the tongue changes. In sprue, as in pernicious anaemia, there is often no hydrochloric acid in the gastric juice. As there are such slight differences between the two diseases, if one is a deficiency disease, the other should be also. Even symptoms such as pigmentation, petechiae and mental disturbances may be found occasionally in sprue.

Though the degeneration of the posterior columns of the cord, which occurs in a certain proportion of cases of pernicious anaemia, has not been found in sprue, yet the author has seen a case of sprue with ataxia and anaesthesia of both legs. From the records of sprue cases he has been able to show that the patients have lived upon an unbalanced diet before contracting the disease, and it is a well-known fact that the food of Europeans in the Dutch Indies contains too much cured rice and canned meat. During the past ten years he has not lost a single case of sprue. The diet has consisted of underdone meat up to a kilogramme or more, 1½-2 litres of raw milk with lime water 5 times a day, cod liver oil, oranges and strawberries. Cases of pernicious anaemia also improve. Three cases are cited, one of pernicious anaemia and two of sprue, to illustrate the improvement in the blood count and in general condition of patients on this diet. In case (1)—pernicious anaemia—the haemoglobin percentage increased from 20 per cent. to 76 per cent., the red blood corpuscles from 980,000 to 4,450,000. In case (2)—sprue—the haemoglobin from 51 per cent. to 77 per cent., red cells from 1,270,000 to 4,000,000 ; in case (3) the haemoglobin from 35 to 80 per cent., red cells from 1,460,000 to 4,900,000.

P. H. M-B.

HUNTER (William). **Blood Changes in Sprue and Pernicious Anaemia.** [Correspondence.]—*Lancet.* 1925. Jan. 31. pp. 255–256.

Hunter, referring to ELDERS' paper (see above), criticizes some of the calculations made from the published blood counts. He points out that in every case the figures of colour-index are one-fifth to one-third higher than they should be, according to accepted standards. According to this calculation, the colour-index in sprue was above normal only in three counts out of twelve, whereas in the pernicious anaemia cases it was above normal in four out of the six counts. Of all the blood changes in pernicious anaemia the most constant feature is the high colour-index. In 200 cases it has been found to be above normal in 83 per cent., normal in 7, and below normal in only 10 per cent. of counts. In other cases of severe anaemia the colour-index is above normal only in 12 per cent., normal in 28, and below normal in no fewer than 60 per cent. of counts; average 0·8. This latter class of case is known as septic anaemia; therefore the sprue anaemia belongs to this type.

P. H. M-B.

WOOD (Edward Jenner). **Pernicious Anemia in its Relationship to Sprue.**—*Amer. Jl. Med. Sciences.* 1925. Jan. Vol. 169. No. 1. (No. 634). pp. 28–38. [21 refs.]

Sprue first attracted attention in the United States when pellagra made its appearance in the Southern States in 1907. Probably the cases tentatively diagnosed as pellagra-sine-pellagra were examples of this disease, but such confusion could not have existed had the blood-picture been considered, which in sprue is so strikingly similar to that of pernicious anaemia. The lack of nervous changes in sprue has been regarded as a point of distinction; it is an error to think that the nerves always escape, as in the case of a lady from Porto Rico who suffered from sprue-like symptoms together with those of subacute combined degeneration of the cord. Very often sprue develops into pernicious anaemia. Achylia gastrica is so frequent in pernicious anaemia that it has been regarded as offering a point of differentiation from sprue. It seems that in the latter it does occur, but later in the course of the disease. The author has discovered the *Monilia psilosis* in the faeces of 15 cases of pernicious anaemia. By feeding guineapigs with cultures of the organism a haemolytic anaemia was produced with changes in the liver and bone marrow suggestive of the action of a haemolytic poison, while a filtrate of *Monilia psilosis* in dextrose water injected intravenously into rabbits caused blood changes which were apparently haemolytic in nature.

P. H. M-B.

BANA (F. D.). **Treatment of Sprue with Calcium and Parathyroid Extract.**—*Brit. Med. Jl.* 1925. Jan. 17. pp. 111–112.

The author thinks that sprue is due to exhaustion of nerve centres or endings in the viscera in general, but particularly in the intestine. The lack of certain principles may affect other nerves, such as the auditory, when deafness and tinnitus are produced. Details are given of a case of sprue in a European in which marked symptoms of that disease and auditory phenomena were present.

[From the clinical account of the case it is by no means convincing that the patient was benefited by the calcium treatment, nor does it bear out the contention that the nerves themselves are involved.]

P. H. M-B.

ANDERSON (D. Drysdale). **Sprue and Parathyroid.**—*St. Bartholomew's Hospital Jl.* 1925. Feb. Vol. 32. No. 5. pp. 73–74. [2 refs.]

Clinical record of a case of sprue in a native-born Mexican woman who, after the birth of her third child, began to suffer from aphthous ulcers in her tongue and mouth and passed frothy, bulky, clay-coloured stools. A great improvement took place on extract of parathyroid gr. 1/10th twice daily from October, so that by the end of the year she was restored to health. No calcium salt was prescribed with the parathyroid, as the diet was considered to contain sufficient.

P. H. M-B.

BRITISH MEDICAL JOURNAL. 1924. Nov. 29. p. 1001.—**Parathyroid Extract in Sprue.** [Memoranda.]

This is a report based upon notes supplied by Dr. D. HENNESSY, of Penang, and affords an example of the rapidity with which sprue symptoms clear up when treatment with parathyroid is undertaken in the early stages of sprue.

Diarrhoea commenced in June, 1924, and the patient, a lady, aged 28, has lost 16 lbs. in weight in ten weeks. Treatment commenced on September 3rd with milk and lime water. Parathyroid extract gr. 1/10th was given twice daily. Six days later, all diarrhoea and discomfort had ceased and the stools were regaining their colour. Nineteen days after commencing treatment the patient left hospital to resume her work.

P. H. M-B.

HARMSEN (E.). **Sprue (Aphthae tropicae).**—*Therap. der Gegenwart.* 1924. Oct. Vol. 65. (New Series. Vol. 26). No. 10. pp. 447–452.

A clinical commentary on a case of sprue observed in Bremen in a patient from Shanghai. It comprises also a review of the literature and a summary of methods of treatment.

P. H. M-B.

GULLY (Percy). **Pernicious Anaemia, Sprue and the Enteric Group.** [Correspondence.]—*Lancet.* 1925, Feb. 7. p. 308.

SCOTT (H. Harold). **The Treatment of Sprue: Based on a New Theory of Causation.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 308–317.

PLAGUE.

BLAZY. **La faune des rongeurs et de leurs parasites cutanés qui interviennent, au Sénégal, dans la propagation de la peste ; sa répartition topographique, ses variations et ses rapports avec les manifestations pesteuses.**—*Bull. Office Internat. d' Hyg. Publique.* 1924. Dec. Vol. 16. No. 12. pp. 1483–1502. [4 refs.]

The rodents susceptible to plague and liable to spread the disease in Senegal are: *Mus rattus*; *M. alexandrinus*; *M. decumanus*: *M. concha*; *M. golunda campanae* (E. ROUBAUD) and *M. musculus*. Golunda, generally a rat of the fields and the "bush," does not hesitate to enter inhabited areas and then lives in contact with house rats. The shrew *Crocidura stampflii* is included since it is frequently found dwelling with plague rats, and may easily be a carrier of infected fleas [see this *Bulletin*, Vol. 19, p. 367 (LEGER & BAURY)]. The flea generally found on the rats is *Xenopsylla cheopis*, and on rare occasions *Sarcopsylla penetrans* occurred. Those who desire statistics will find in this paper Tables giving percentage parasites on various rats for August-September of 1924; comparative records of human and rodent plague; and percentage of infected rats among those examined from October, 1921, to December, 1922. [See this *Bulletin*, l. c. pp. 367–368 (TEPPAZ, NOC, RIGOLLET).]

J. H. Tull Walsh.

MORA (A. Damas). **La peste en Angola.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 315–329.

As the author states, the true value of this report is that it brings together epidemiological observations collected since plague entered Loanda in January or February, 1921 [this *Bulletin*, Vol. 19, p. 368; Vol. 20, pp. 741–742 (MORA)]. Anti-plague vaccination was carried out, and before the second epidemic appeared 12,000 persons were vaccinated. The author states that in houses where plague was present a large number of protected persons escaped infection. The inhabitants offer no objection to anti-plague vaccination.

J. H. T. W.

ANDRUZZI (Alcidiade). **Relazione sulla epidemia di peste bubbonica verificatasi al villaggio "Duca degli Abruzzi" (Novembre 1923–Febbraio 1924).** [An Epidemic of Bubonic Plague at the Village "D.d.A." (Nov., 1923-Feb., 1924).]—*Ann. di Med. Nav. e Colon.* 1924. July-Aug. Year 30. Vol. 2. No. 1–2. pp. 68–82.

This is a detailed, interesting and well written account of an epidemic in Italian Somaliland, its general features and management. Statistics showed that among cases treated with anti-plague serum the mortality was 16·3 per cent.; among cases not treated with the serum the mortality was 85·7 per cent.

J. H. T. W.

Sabolotny (D. K.). [**Zum Aufflackern der Pest im Baikalgebiet und in der Mandschurei.**]—*Prophylaktische Medizin* (*russisch*). Charkow. 1923. Year 2. No. 1–2.

Tscherwentzow (A. N.). [**Die Bubonenpest im Baikalgebiet im Verlauf der letzten 10 Jahre.**]—*Ibid.*

Ssuknew (W. W.). [**Die Pestepidemien des Herbstes 1923 im Baikalgebiet.**] *Ibid.* [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. p. 302.]

These three papers review the outbreaks of plague in the Baikal area from 1911 onward. It is recorded that epidemics, beginning with bubonic plague, developed later into epidemics of pneumonic plague. In almost all instances there existed an epizoötic of plague among tarabagans. The authors also describe the methods used to combat the infection. [Plague in the Baikal and Trans-Baikal area has been frequently noticed in this *Bulletin*; see Vol. 21, p. 71 (Sabolotny); p. 879 (Wu-Lien-Teh); also index.]

J. H. T. W.

Tsurumi (M.). **Recherches sur la peste pulmonaire.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. Nov. Vol. 16. No. 11. pp. 1369–1391.

This very long and detailed report was presented to the Committee by the author, delegate from Japan, at the October session, 1924. He brings together all the observations furnished by the epidemics of pneumonic plague in Manchuria. Most of the aspects dealt with are referred to in separate papers by various authors, and have received notice in this *Bulletin* (see index).

J. H. T. W.

Fujinami (Akira). **A Study of the Morbid Histology of the 1921 Manchurian Plague Epidemic.**—*Nat. Med. Jl. China.* 1924. Oct. Vol. 10. No. 5. pp. 287–306.

The descriptions of the morbid histological conditions of the organs and tissues are based upon small specimens from twenty-three cases of pneumonic plague supplied by Dr. Wu Lien-Teh.

The most important tissue changes occur in the lungs and neighbouring bronchial lymph glands; plague bacilli are most abundant, and the tissue changes which take place are mainly due to the presence of these bacilli. The lungs are affected by hyperaemic, serous and cellular exudation, and more or less haemorrhage. The specimens did not, however, reveal specially marked haemorrhage into the alveoli. Fibrin was inconsiderable. Hyaline substance was in most cases found deposited on the alveolar walls. The plague bacilli are abundant not only in the alveoli but also in the interstitial tissue, especially in the lymph vessels and spaces in the neighbourhood of the bronchi and blood vessels, and under the pleura. The lymph vessels at the root of the lung and near the infected bronchial glands are likewise always greatly dilated and filled with bacilli. The multiplication of bacilli in the peribronchial and perivascular lymph vessels is a most important cause of the lobular pneumonia. The spread of pneumonic areas may also be due to inhalation of plague bacilli from the upper and wider parts of the bronchi; the bacilli

penetrate from the mucous membrane, whose epithelium is more or less destroyed. The bronchial lymphatic glands are most severely affected. The tissues of the mesenterial glands showed only slight evidence of the presence of plague bacilli and in the cervical glands no large accumulations of bacilli were found. The tonsils are only slightly affected, comparatively small accumulations of bacilli being found, and these mainly in the superficial layer. In nearly all organs bacilli are found in the blood vessels. Next to the lungs and lymph glands they are most numerous in the spleen and liver. [See below (KULESHA).]

J. H. T. W.

KULESHA (G. S.). **On Pathologic Anatomy of Lung Plague. Lesions of Mucous Membrane in the Respiratory Tract during Lung Plague.** —*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 125–130. [5 refs.] With 1 plate. English summary pp. 214–215.

KULESCHA (G. S.). **Beitrag zur pathologischen Anatomie der Lungenpest. Die Erkrankung der Schleimhäute der oberen Luftwege bei Lungenpeste.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1925. Jan. 10. Vol. 254. No. 1. pp. 174–183. With 3 figs. in colour.

Material for the work now recorded was collected and observed during the outbreak of pneumonic plague in Manchuria, Uralsk District, in 1913. Macroscopic examination showed only acute catarrh of the mucous membrane in the larynx, trachea and bronchi; also in the pharnyx and adjacent areas. Microscopic examination, however, disclosed well pronounced and specific alterations: (1) Tonsils (see plate, figs. 1 & 2): appearance of pustules in epithelial layer containing leucocytes and conglomerates of plague bacilli. The subepithelial tissue contained a number of plague bacilli especially around the blood vessels; (2) Trachea and large bronchi: "bocal-shaped" cells of the mucous membrane contained oval bodies that consisted of a mass of *B. pestis* (Pl. fig. 3). In the submucosa there was such an accumulation of microbes that only the blood vessels could be distinguished in the bacterial masses. Two peculiarities are specific: the absence of any sharp reaction of tissues and the penetration of bacilli into the vessels (capillaries and small veins) in the places of bacterial accumulation.

The opinion that infection of the tonsils causes not lung plague, but the appearance of buboes in the neck is unfounded, as in all the cases where the above lesions were found in the tonsils by the author plague buboes were absent. The author states that: "There is an opinion established . . . that introduction of plague infection into the mouth cavity of cats does not bring about pneumonic plague, but causes bubonic plague with lesions of the glands of the neck." During the outbreak a cat was found which had died of lung plague through eating infected flesh from its master's body, driven to such food by starvation (*cf.* this *Bulletin*, Vol. 19, pp. 372–373 (WU LIEN-TEH)].

J. H. T. W.

Sharp (N. A. Dyce). **The Diagnosis of Pneumonic Plague.** [Correspondence.]—*Brit. Med. Jl.* 1924. Dec. 27. p. 1216.

The writer desires a method of establishing the diagnosis between plague complicated with pneumonia and pneumonic plague. The text books give him no satisfaction; but he quotes Stitt's opinion: "that plague complicated with pneumonia is the origin of, if not identical with, pneumonic plague." [We agree with Stitt. The difference is only that of source and method of infection, and not due to two forms of pathological and clinical pneumonia. Pneumonic plague is evident when it arises in some village or area to which infection has been carried from an epidemic focus; but we must not lose sight of the fact that cases of pneumonic plague occur in the epidemic area together with the septicaemic and bubonic forms.]

J. H. T. W.

Augagneur. **Une épidémie de peste pulmonaire à Tananarive.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan.-Feb.-Mar.-Apr. Vol. 22. No. 1. pp. 90–100. With 1 fig.

On October 7th, 1923, Dr. Villette, of the Pasteur Institute, reported to the Director of the Sanitary Service that a woman had died of pneumonic plague at the "Maternity." Yersin's bacillus found in the lungs. On the 19th the uncle of the woman died at Ankadidanibe about 12 kilometres from Antananarivo. Relatives journeyed to Antananarivo to be present at the funeral, and, as is the custom, remained several days with the family of the deceased. It further transpired that Ramavo, daughter of the woman mentioned above, had died on September 26th, after a few days of illness. After the funeral of this girl a relative died on October 2nd of pneumonia; but no plague bacilli were found on puncture of the liver. There were, therefore, several foci from which infection might spread, and did spread, as is well shown in a diagram.

There were 27 cases; all died. Twenty-two gave positive results for *B. pestis*; 5 examinations gave negative results. The author points out the extreme importance of following out the tracks of any possible infection, and the absolute necessity of isolating every person who has been in contact with a case of plague.

J. H. T. W.

Nicolle (Charles) & Gobert (E.). **Considérations générales sur la peste pulmonaire et sur sa nature à propos de quelques petits foyers de cette forme de peste observés en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1924. June. Vol. 13. No. 2. pp. 212–225. [14 refs.]

The small outbreaks do not differ in any important particular from those elsewhere recorded. The source of infection was traced in some of the epidemics, but not in all of them. In some instances rats were found suffering from plague, in others there was no sign of an epizootic among rats. The authors state as a theory that pulmonary plague is a secondary infection by plague bacilli during influenza. As a primary condition in this conception there must exist healthy human

carriers of *B. pestis* [*v.* this *Bulletin*, Vol. 21, p. 878 (LEGER & BAURY)]. The authors write :—

There is no doubt that two distinct forms of plague exist without evident relation to one another.

1. *Bubonic plague* passing generally from the rat [or other rodent] to man, and rarely from man to man, and not accompanied by pneumonia except occasionally as a secondary complication.

2. *Pneumonic plague*, in which the attack starts in the lungs, and which is generally fatal ; it is not accompanied with buboes, and is not related to rat-plague [?], and is strongly contagious from man to man.

F. Norman WHITE (*Rapport soumis au Comité d'Hygiène de la Société des Nations*. Geneva, 1924)* has put forward the hypothesis that this pulmonary plague is due to the association of an unknown microbe, not pathogenic for rats, with the bacillus of plague. We adopt this conception, and we regard the influenza virus as the agent in this association.

J. H. T. W.

URIARTE (Léopold). **Persistance du bacille de la peste dans l'organisme infecté.**—*C.R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1039–1040.

" Some time ago I had the opportunity of observing a case of plague. It was bubonic plague, and presented, as a rare complication, iridocyclitis in one eye, with abundant hypopyon. With serum treatment the case progressed favourably, symptoms disappeared, and the patient was considered to be cured. The ganglionic infarct was reduced as also the ocular lesion, but with loss of vision. However, three weeks later the patient died suddenly. At the autopsy the cerebral meninges were found congested, and showed several yellow granules the size of a pin's head. Examined microscopically these were found to consist of globules of pus containing *B. pestis* ; the bacilli were also found in the ocular lesion. These bacilli were virulent ; inoculated into guineapigs they caused death with the recognized lesions."

J. H. T. W.

URIARTE (L.). & GONZALEZ (S.). **Infection pesteuse chez un Rongeur sauvage.**—*C.R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1040–1041.

The authors report that in the Argentine they have found the " Cuis," *Cavia aperea*, infected with plague. Several times the epizoötics have coincided with the appearance of cases of human plague.

J. H. T. W.

NIKANOROV (S.). **Sur le traitement de la peste bubonique et pulmonaire par le vaccin antipesteux glycériné.**—*Rev. Microbiol. et Épidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 182–185. French summary pp. 224–225. [2 refs.]

The detailed histories of the patients are to be found in the Russian text.

Cases of cure of pneumonic plague are rare, and even in bubonic plague on the Russian steppes the mortality is 50 to 80 per cent. Convalescence of bubonic plague is always extremely slow, and the cicatrization of open and suppurating buboes long drawn out. If the

* See *Sanitation Supplements*. 1924. pp. 182–7.

buboes are not open reduction takes even a longer time. In 1923 the author treated plague with anti-plague vaccine in physiological saline. The results were not encouraging.

In 1924, influenced by M. BERNARD's method of preparing an anti-staphylococcus vaccine, the author prepared his vaccine. Cultures of *B. pestis* on agar, incubated for 48 hours, were stirred in saline, and the mixed dilution centrifuged, washed three times in the centrifuge, and the clot diluted with 50·0 cc. of glycerine, sterilized and placed in the ice-chest. All the germs were dead at the end of 1 to 3 months. At the end of this period control experiments were undertaken to ensure sterility, after which sufficient physiological saline was added to give 100 million germs per cc. of vaccine. The vaccine was given subcutaneously, daily or every second day, in doses of 0·5 to 1·15 cc., until the patient died or recovered. Seventeen cases of bubonic plague were treated; 14 recovered (mortality 20 per cent.). Doses of the vaccine also hastened the reduction of buboes and lessened the suppuration of open buboes. Two of the cases of bubonic plague were complicated by pneumonia; one of these was saved by treatment with the vaccine.

In primary pneumonic plague the author noticed improvement and fall of temperature, but no cures resulted.

J. H. T. W.

MARSHALL (Claude H.) & RAM (Achhru). **The Treatment of Plague in Uganda.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 207–209. [2 refs.]

Uganda Protectorate is rarely free from sporadic cases of plague, while from time to time an epidemic occurs. The question of treatment has offered great difficulties. In 1917 one of the authors (A. R.) treated 103 cases by intravenous injections of iodine, but only 16 of these recovered. In 1920, during an outbreak of plague in the Indian Bazaar, Kampala, Dr. C. J. BAKER treated 50 cases with iodine intravenously; 19 recovered, 31 died. Tincture of iodine was given orally (see this *Bulletin*, Vol. 19, pp. 368–369). The authors refer to treatment with neokharsivan, *loc. cit.*, p. 732 (MANSOOR); Vol. 21, pp. 67–68 (MARSHALL & RAM). During 1923 the authors continued to treat plague by intravenous injections of arsenical preparations:—

	Total.	*Cured.*	*Died.*
Pneumonic	2	0	2
Septicaemic	2	2	0
Bubonic (advanced cases)	11	2	9
„ (early „)	11	8	3
Septicaemic and bubonic	1	1	0
	27	13	14

[See this *Bulletin*, Vol. 21, p. 67 (NEILSON); p. 884 (PAL). No mention is made of treatment with anti-plague serum.]

J. H. T. W.

BALFOUR (Andrew). **The Treatment of Plague: A Suggestion.** [Correspondence.]—*Brit. Med. Jl.* 1924. Dec. 6. p. 1081.

The writer draws attention to the urgent necessity of finding a remedy for plague. Anti-plague serum, useful if given early in large doses,

is not always reliable. Most drugs are useless; tincture of iodine and novarsenobillon administered intravenously appear to be the best. Dr. Balfour recommends a trial of "mercurochrome 220 soluble" given with success in enteric and puerperal fevers. In both bacteriaemia is present as in plague. It has been used, as recorded by GREELEY, in Rocky Mountain fever with good results.

Occasionally when given intravenously mercurochrome causes a severe reaction, but as a rule the reaction is moderate and the drug can be administered with safety. Any risk of ptyalism can be combated by a mouth-wash of turpentine used alternatively with hydrogen peroxide. As to dose, YOUNG and HILL state that for intravenous injection in puerperal sepsis and acute gonorrhoea, a 1 per cent. solution in water may be employed and from 2 to 5 mgm. per kilo of body weight given. GREELEY gave doses of 20·0 cc. of a 1 per cent. solution, and in typhoid fever BOND and BARRIER found 15·0 cc. per 100 lb. of body weight an average effective dose; in plague 20·0 cc. might be used in severe cases. Mercurochrome is dibromo-oxy-mercury-fluorescein, or its sodium salt, $C_{20}H_7O_5Br_2HgOHNa_2$.

J. H. T. W.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1923.** [MACKIE (F. P.), Offg. Director.]—49 pp. With 3 charts. 1924. Bombay: Govt. Central Press. [Price As. 14 Ps. 6.]

This Report is arranged on the same lines as in previous years. The output in doses of anti-plague vaccine for 1923 and for the previous four years is given. For 1923 the number was: 1,298,415. Many rats were received for examination. Of those dead when received, 305,343 were examined, and 8,476 were found to be infected with plague. An interesting chart is reproduced (see over) showing the percentage of plague-infected rats at different seasons of the year.

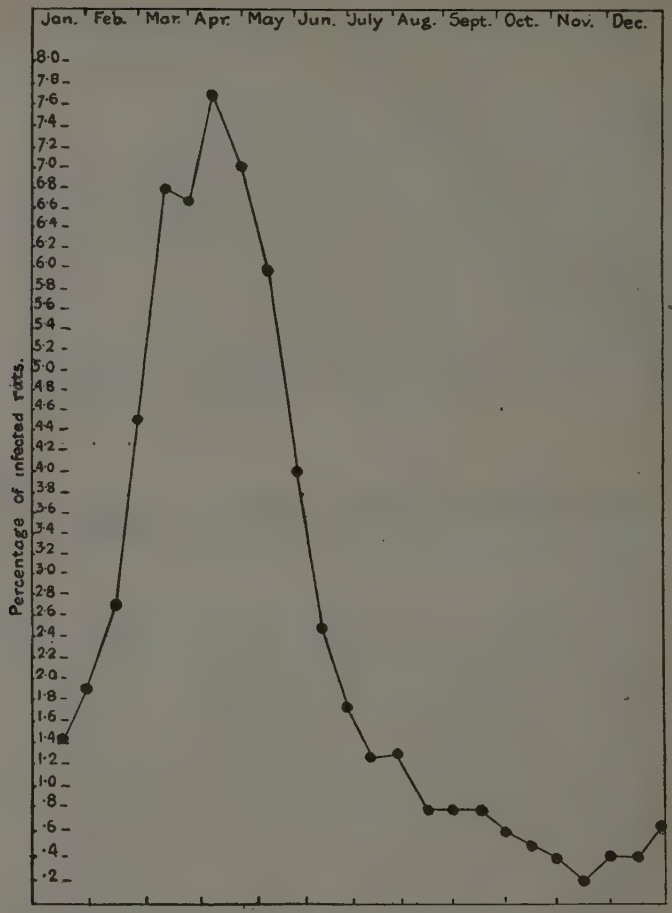
The comparative experiments on transmission of plague by *X. cheopis* and *X. astia* have already received notice; this *Bulletin*, Vol. 21, p. 440 (TAYLOR & CHITRE). There is (pp. 21–22) a note by Major J. TAYLOR, I.M.S., and Assistant Surgeon G. D. CHITRE on an electric rat-guard for ships' hawsers. Their conclusions were:—

"The three series of tests show that the rat-guard described provides, under strict conditions of test, a complete obstruction to the passage of rats along cables when used with an alternating current of 230 volts. With a direct current of 110 volts (the current usually available on ships) full protection is not obtained. A 230-volt alternating current will usually be available in ports such as Bombay, and if connected to a guard of this type will prevent any traffic of rats between the shore and ships along the hawsers."

On page 28 there is brief note on Haffkine's Plague Prophylactic and its constituent parts. It is concerned with the two parts of the vaccines: the supernatant fluid and the sediment. The conclusions drawn are:—

"1. The whole prophylactic given in a dose of 0·5 cc. killed 35 per cent. of rats from toxaemia and produced an immunity which reduced the mortality among infected rats from 95·3 per cent. to 55·6 per cent.

"2. The supernatant fluid is less toxic (19·8 per cent.) than the whole prophylactic, and is as efficacious in producing immunity as the whole prophylactic (53·1 per cent.).



The percentage of plague-infected rats at different seasons of the year in Bombay City in 1923.

[Reproduced from the *Report of the Bombay Bacteriological Laboratory for the Year 1923.*]

"3. The sediment, in the doses employed, has little or no toxic properties, and little or no immunizing properties for rats" [*v.* this *Bulletin*, Vol. 21, p. 882 (Stevenson & Kapadia)].

On page 29 there is a section dealing with oral vaccination of rats and guineapigs. The experiments with rats failed: they refused to eat food containing bile, and when fed with a catheter, most died of oedema of the glottis. Survivors died of plague within 10 days of infection with "test virus." As to guineapigs, oral administration of the vaccine, with or without bile, affords no protection against subsequent infection.

J. H. T. W.

i. Morison (J.), Naidu (B. P. B.) & Avari (C. R.). **The Production of Immunity against Plague by Vaccine. I. Haffkine's Plague Prophylactic. II. Agar Cultures. III. Immunisation by Oral Administration of Plague Vaccine with and without Bile.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 313–320. [11 refs.]; pp. 321–326. [1 ref.]; pp. 327–330.

ii. Mackie (F. P.). **Commentary on the Foregoing Papers on the Production of Immunity against Plague by Vaccine.**—*Ibid.* pp. 331–332.

i. I and III already noticed under Bombay Bacteriological Laboratory (see above).

II. "When compared with 0·5 cc. of Haffkine's prophylactic, agar cultures treated with formalin and acetone are not toxic and show no evidence of immunizing power, even in doses of 12·5 milligrams. Agar cultures treated with chloroform vapour and 1 per cent. carbolic acid show no immunizing power until the weight of dried vaccine exceeds 13·6 mgm. Agar cultures treated with 1 per cent. carbolic acid possess immunizing properties when used in a dose of 8 mgm. Agar cultures heated at 60° C. for 15 minutes and then carbolized to contain 0·5 per cent. carbolic acid possess immunizing value with doses of 4 mgm. and upwards. Only with heated vaccine does the toxicity regularly increase with the dose."

ii. The writer notes that it is not by any means certain that the toxicity test on rats as used by the investigators is identical with or bears any relation to the reaction brought about in the human tissues at the site of inoculation. He further states that the attempts to improve Haffkine's vaccine on the lines indicated in the foregoing papers have not given results justifying any important modification in the present methods of manufacture.

J. H. T. W.

Girard (G.) & Quimaud (J.). **Essai d'immunisation antipesteuse par cutivaccination chez le cobaye.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 471–475. [2 refs.]

These experiments are said to confirm the impossibility of rendering guineapigs immune by means of heated anti-plague vaccines. The vaccines used were the aqueous vaccine of the Pasteur Institute, Paris, and the lipo-vaccine of Le Moignic [see this *Bulletin*, Vol. 12, p. 361]. Excluding the guineapigs that died during the experiments, there remained nine animals subcutaneously vaccinated, of which two died after a virulent inoculation of plague. The action of the vaccine, though feeble, is not in doubt. Of 9 animals cutaneously vaccinated by scarification 7 died of septicaemic plague, as did the controls. The authors conclude that: "This latter technique does not offer any advantage over the former; it is, rather, inferior to it."

J. H. T. W.

di Mattei (Eugenio). **Il reperto anatomico dell' infezione pestosa dei murini come contributo alla diagnosi e alla epidemiologia della peste.** [Morbid Anatomy of Plague Infection of Rats, Contribution to Diagnosis and Epidemiology.]—*Ann. d'Igiene.* 1924. Nov. Vol. 34. No. 11. pp. 781–795. [17 refs.]

Beginning with a reference to the *Report on Plague Investigations in India*, the author gives numerous references to work done by other

investigators. *M. decumanus* and *M. rattus* were used in his experiments, and the animals were infected by different methods, each organ being carefully examined after death. The morbid anatomy of rodents dying of natural or experimental plague has often been described and the author's paper gives us nothing that is new. The bacteriology is, of course, also described.

J. H. T. W.

Ohoto (Osamu). *B. pestis* **in Blood, Bile and Urine.**—*Jl. Infect. Dis.* 1924. Sept. Vol. 35. No. 3. pp. 291–294. [3 refs.]

In whatever way *B. pestis* was inoculated it entered the circulating blood in all the animals. Of 6 samples of urine 5 contained *B. pestis*. On cultivation, bile in 6 of 9 cases gave growth of bacilli. In view of these observations plague apparently develops in much the same manner that typhoid fever does. The invasion of bacilli into the blood may occur earlier than generally recognized, and they may grow not only in tissues but also in the blood itself. That bacilli pass out in the bile and urine seems quite probable [*v.* this *Bulletin*, Vol. 21, p. 69 (Ohoto)].

J. H. T. W.

Uriarte (L.) & Morales Villazon (N.). **Procédé de culture pour différencier le bacille de la peste.**—*C. R. Soc. Biol.* 1924. Nov. 14. Vol. 91. No. 31. pp. 1041–1043.

The authors use a culture medium prepared as follows :—

Water 1,000 gm., peptone 20 gm., rendered slightly alkaline. If necessary it is precipitated and filtered. Then add 8 gm. of glucose or laevulose, and 4 to 6 cc. of a 1 per cent. solution of neutral red. Place 8 to 10 cc. in ordinary culture tubes and in each of these tubes place a little tube 45 mm. long and 10 mm. in diameter with the opening directed downwards as a fermentation tube. Sterilize at 110°, which also drives all air out of the tubes. The medium has an orange-red colour, and *B. pestis* grows well in it, showing the following characters : (1) 20 to 48 hours after inoculation the colour changes to "solferino" diminishing in intensity after 3 or 4 days ; (2) no gas is produced ; (3) throughout the column of liquid growth occurs in little floccules resting against the surface of the large tube or the outer surface of the small tube ; otherwise the liquid remains clear. If these three conditions do not exist together the culture is impure.

J. H. T. W.

Comptes Rendus du 4-ième Congrès antipesteux organisé à Saratov par l'Institut de microbiologie et d'épidémiologie d'état du Sud-Est de la Russie de 19 à 23 mars de 1924.—201 pp. With 1 map. 3 plates & 3 figs. [In Russian. Resolutions translated into French pp. 145–152.]

While these Resolutions show knowledge of the existing conditions and an ardent desire to carry out any work that can help in the abolition or treatment of plague, be the work done in the laboratory or in the field, they add nothing to our knowledge of plague.

J. H. T. W.

IGLESIAS (M. S.). **[Extinction of Foci of Plague.]**—*Gac. Méd. de Mexico.* 1923. Dec. Vol. 55, p. 713. [Summarized in *Jl. Amer. Med. Assoc.* 1924. June 7. Vol. 82. No. 23. p. 1901.]

The author declares that no instance is known of plague having been conveyed by land traffic in bales or other goods containing rats. Rats will not stay in freight that is handled much and jolted. [It would not be safe to accept this as absolute. Even if infected rats fled from the bales on movement infected fleas and bacilli might remain dangerous for a few days. [See this *Bulletin*, Vol. 18, p. 345 (FLU); Vol. 20, p. 360 (SWELLENGREBEL).]

J. H. T. W.

ZEISS (H.). **Weitere Untersuchungen ueber die Einwirkung von Yatren auf Pestbakterien.** [Action of Yatren on Plague Bacillus.]—*Rev. Microbiol. et Epidemiol.* Saratov. 1924. Vol. 3. No. 3. In Russian pp. 147–149. [5 refs.] German summary pp. 219–220. [1 ref.]

For the earlier work see this *Bulletin*, Vol. 21, p. 883. In the present investigation animals were inoculated; the results were not uniform, and are not very convincing.

J. H. T. W.

MANTEUFEL (P.). **Neuere Ergebnisse der Pestepidemiologie.** [Recent Findings in Plague Epidemiology.]—*Seuchenbekämpfung.* 1925. Vol. 2. No. 1/2. pp. 33–36.

Readers of this *Bulletin* will not find anything new in Dr. Manteufel's paper. He mentions a recent theory put forward by Norman WHITE and supported by NICOLLE and GOBERT [see above, p. 376]; but he is careful to remark that the theory has still to stand the test of criticism.

J. H. T. W.

LEGER (Marcel). **Considérations sur l'épidemiologie de la peste. L'homme peut, comme le rat, être un réservoir de virus.**—*Revista Méd. de Angola.* (No. especial 1e Congresso de Med. Trop. da Africa Ocidental. Vol. 3. 3a. 4a. e 5a. Sessões.) 1923. Aug. No. 4. pp. 309–313. [4 refs.]

The facts upon which this paper is based will be found in this *Bulletin*, Vol. 21, p. 878 (LEGER & BAURY.)

J. H. T. W

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. Trans. Fifth Biennial Congress, Singapore, 1923. pp. 286–351. **VI.—Plague.** [WU LIEN TEH, TSURUMI (M.) & VERVOORT (H.).]

FARRER (E. M.). **Clinical Notes on Plague.**—*Jl. Assoc. Med. Women in India.* 1924. Aug. Vol. 12. No. 3. pp. 11–15.

FUJINAMI (Akira) & WU LIEN TEH. **Morbid Histology of Pneumonic Plague.**—*China Med. Jl.* 1924. Aug. Vol. 38. No. 8. pp. 617–626.

GIRARD (G.). **Sur la virulence de la peste murine à Tananarive.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 525–528. [2 refs.]

GOBERT & CONSEIL. **[Sur quelques cas de peste constatés à Tunis en 1922.]**—*Rev. Tunisienne des Sciences Médicales et Tunis-Médical.* 1923. Feb. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1924. Apr. Vol. 16. No. 4. pp. 475–476.]

GOTO (Osamu). **[Studies on *Bacillus pestis*. II.—Communication. On the Appearance of the Plague Bacillus in the Blood, Bile and Urine.]**—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1923. July. Vol. 22. No. 7. [Summarized in *Japan Med. World.* Tokyo. 1924. Jan. 15. Vol. 4. No. 1. p. 15.]

GRAHAM (J. D.). **Notes épidémiologiques sur la peste dans l'Inde Britannique au cours des dernières années.** [Extracts.]—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 581–586.

HANNA (W.). **The Fumigation of Vessels as an Anti-Plague Measure.**—*Jl. Roy. Sanitary Institute.* 1924. Jan. Vol. 44. No. 8. pp. 280–288.

JIMENEZ (J.). **Observation d'une épidémie de peste dans le port de Malaga (juin-septembre 1923).**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 20–23.

JOANNIDÈS (Georges Sp.). **Considérations sur les dernières épidémies de peste à Messène (Nissi) et à Syra.**—*Grèce Méd.* 1925. Jan.-Feb. Vol. 27. No. 1–2. pp. 3–5. [1 ref.]

JORGE (Ricardo). **Rémarques à propos de la peste.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 592–595.

MITCHELL (Alexandre). **Les épidémies de peste dans l'Union de l'Afrique du Sud.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 566–571. With 1 map in text.
[*v.* this *Bulletin*, Vol. 19, p. 366 (HAYDON).]

NIKANOROV (S.). **L'épidémie de peste dans le village Kitchkino l'arrondissement des Kalmouks, au juin-août 1923.** [Abstract.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. pp. 104–106. [In Russian pp. 55–63.]

——. **La peste et la lutte contre elle au Sud-Est de la Russie.—Communication à la Conférence internationale sur le paludisme organisée par le Comité d'Hygiène de la Société des Nations.**—3 pp. With 1 map & 2 charts. 1924. Saratov.

DE PENNING (H. C.). **The Diagnosis of Pneumonic Plague.** [Correspondence.]—*Brit. Med. Jl.* 1925. Mar. 14. p. 532.

PETRIE (G. F.). **A Commentary on Recent Plague Investigations in Transbaikalia and Southern Russia.**—*Jl. of Hyg.* 1924. July. Vol. 22. No. 4. pp. 397–401. [14 refs.]

REES (D. C.) & MITCHELL (J. A.). **Plague: A Brief Account of its Symptoms, Clinical Diagnosis, Morbid Anatomy, and Treatment.**—*Med. Jl. S Africa.* 1924. June. Vol. 19. No. 11. pp. 350–355.

SHUKEVICH (J.) & KLINOV (V.). **Outbreak of Plague at Trapezund in 1917.** [Abstract.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1924. Vol. 3. No. 4. p. 307. [In Russian pp. 259–270.]

TSURUMI (Mitsuso). **Note préliminaire sur la peste en Extreme-Orient.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 587–588.

CORRESPONDENCE.

CLEMOW (F. G.). **Plague and the Tarabagan** [Correspondence].—*Lancet.* 1924. Sept. 6. p. 526.

With reference to the note on Dr. Clemow's letter which was published in this *Bulletin* (Vol. 21, p. 879), Dr. J. W. H. CHUN, Acting Director and C.M.O. of the North Manchurian Plague Prevention Service, writes from Harbin to correct the statement that Dr. WU LIEN-YEH has not given credit to the Russians who wrote between 1881 and 1911 on this subject. The Russian observations are summarized by Dr. WU, he states, in the 4th volume of Reports of the North Manchurian Plague Prevention Service in his article. "Plague in the Wild Rodents, including the Latest Investigations into the Rôle played by the Tarabagan."

Little of the early work, however, is mentioned here. For this another article, "The Original Home of Plague" (pp. 178–98), should be consulted, or better still, Dr. CLEMOW's "Plague in Siberia and Mongolia and the Tarabagan." *Jl. Trop. Med. & Hyg.* 1900. p. 169.—Editor.

CHOLERA.

BARIKIN (W.) & ZACHAROFF (A.). **Die Epidemiologie der gegenwärtigen Cholera in Russland.** [Epidemiology of Cholera in Russia.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. July 15. Vol. 92. No. 3/4. pp. 201–208.

The authors describe the epidemiology of cholera epidemics during the last few years. These outbreaks displayed the usual characters, here and there generally endemic, in some places (*e.g.*, Rostow) showing summer and autumn maxima with exacerbations in the spring. In 1921-1922 the famine, which compelled the peasants to eat the bark of trees, clay, etc., rendered them easy victims to cholera infection.

J. H. Tull Walsh.

CHATTERJEE (Sachindra Nath). **Notes on a Few Cases of Cholera treated by Various Methods of Treatment.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 554–557.

The methods of treatment compared were :—

(1) The essential oils mixture ; (2) essential oils and permanganate of potassium ; (3) kaolin, alone, and with the permanganate ; (4) " Rogers Treatment."

The numbers treated were small, 5 or 6 in each section, and no really definite opinion is possible. The author is of opinion that :—

" The intravenous injection is a long procedure and cannot be repeated in village practice. It is, however, found that rectal injection of tepid normal saline every 2 to 4 hours according to the urgency of the case, with permanganate pills, sometimes are of more service, but it is also not as practicable as kaolin and permanganate in village use where the majority of the people are illiterate, and also it is almost impossible in the case of female patients. But further experiment is necessary before coming to a final decision that *kaolin and permanganate is the best and easiest method of treating cases of cholera in village practice.*"

J. H. T. W.

MINERVIN (S.). **Eine Selektionsmethode für den Choleravibrio.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Nov. 15. Vol. 93. No. 5. pp. 334–340.

From plate cultures of *V. cholerae* the author takes separate colonies and tests their agglutinating reaction. Colonies with low agglutinating power are sown on agar slopes and again in Petri dishes, The vibrios can be classed according to agglutinating power. This method of selecting individual colonies shows different grades of agglutination down to its absence. The presence of such vibrios as those giving no reaction, if occurring in natural conditions, would make diagnosis of cholera sometimes difficult.

J. H. T. W.

NOBECHI (Keizo). **Contributions to the Knowledge of** *Vibrio cholerae.* **1. Studies upon Immotile Strains of** *Vibrio cholerae.* **2. Fermentation of Carbohydrates and Polyatomic Alcohols by** *Vibrio cholerae.* **3. Immunological Studies upon the Types of** *Vibrio cholerae.*—*Scientific Reports from Govt. Inst. for Infect. Diseases.* Tokyo. 1923. Vol. 2, pp. 1–87. [93 refs.]

These papers contain accounts of laboratory and experimental work. Here and there the author claims a new method or a new result. Conclusions :—

1. The author found two immotile strains among 88 stock cultures from various sources and of various ages. Except for loss of motility, they reveal typical features : morphological, cultural, biological and immunological. Their pathogenicity for guineapigs is the same as that of normal motile strains. Their immotility is due to absence of flagellum. The immotility was inherited for thirty months ; there was no reversion. The author classifies them as :—

{ *Microspira comma* Schröter var. *immobilis* Nobechi (1923).
{ *Vibrio cholerae* Buchner „ „ „ „

2. Twenty-one selected strains of *V. cholerae* attacked in the same manner twelve carbohydrates, four polyatomic alcohols and one glycoside. [*v.* this *Bulletin*, Vol. 21, p. 449 (SUHATZEANOU & THÉODORASCO).]

3. A new immunological type of cholera strains, placed between KABESHIMA's " original " and " varied " types, was discovered, and is called the " middle type."

" All middle type strains are agglutinated by the sera of the two other types, capable to differentiate the strains of the two types from each other, to the same titre with corresponding strains ; and the middle type sera, with no exception, agglutinate all strains of the other types as well of the middle type almost uniformly high. From the result of the agglutinin absorption test, the middle type strains studied by the author are assumed to be provided with the common antigene X, and the original type specific A, at the same time also with the varied type specific B, though the development of the last is incomplete."

The " middle " type is not a mixture of the other two, but a definite type. All three types—" original," " middle," and varied "—were constant in growth on routine agar media during the year and a-half that the " middle " type was tested. The author states that in 1921 four cases from Shanghai gave the " middle " type, and that during the 1922 epidemic " all strains collected from various districts and from different stages of the epidemic were proven to be attributable to the middle type."

J. H. T. W.

i. GRATIA (André) & RHODES (Bernice). **Production d'anticorps bactériolytiques et hémolytiques par la voie cutanée.**—*C. R. Soc. Biol.* 1924. Oct. 7. Vol. 91. No. 28. pp. 797–798. [2 refs.]

ii. CIUCA (M.) & BALTEANU (I.). **A propos de la note de A. Gratia et B. Rhodes.**—*Ibid.* Dec. 5. No. 34. pp. 1228–1229. [2 refs.]

i. The authors' work is a mere repetition of experiments recorded by CIUCA and BALTEANU [this *Bulletin*, Vol. 21, p. 448] with different conclusions. They find that guineapigs, protected by cutaneous vaccination with friction of the skin, are just as well protected against infection as those receiving intra-peritoneal vaccination. Also, they

consider that the serum of guineapigs after "cuti-vaccination" possesses a protective power equal to the serum of those vaccinated by the peritoneal route.

ii. Ciuca and Balteanu do not admit that the serum of guineapigs after cuti-vaccination contains any antibody and their results showed that such serum had no prophylactic properties. They admit that guineapigs resist infection after cuti-vaccination; but they deny that antibodies are produced in the blood.

J. H. T. W.

Picazio (A.). **Sulla ricerca dei vibrioni delle acque.**—*Riforma Med.* 1924. Dec. 1. Vol. 40. No. 48. pp. 1133–1136. [10 refs.]

Mainly a résumé of work recorded, by previous investigators, into the nature and properties of vibrios found in water, including the cholera vibrio and those similar to it. In his own experiments the author describes the growth of vibrios in alkaline peptone water and on the Endo and Dieudonné media, agglutination results and methods of diagnosis. The list of references is full and useful.

J. H. T. W.

Golovanoff (M.). **Contribution à l'étude de l'anti-virus cholérique.**—*C.R. Soc. Biol.* 1924. Oct. 31. Vol. 91. No. 30. pp. 929–930. [1 ref.]

The author records further experiments with cholera "anti-virus" [Bacteriophage]. The animals used were rabbits and the object of the work was to find out if injection of "anti-virus" led to the formation of antibodies. Control experiments were made with vibrio vaccine. The author concludes that "only the bodies of cholera vibrios give rise to antibodies; filtered cultures do not although they confer protection." [*v.* this *Bulletin*, Vol. 21, pp. 447–448 (Besredka & Golovanoff).]

J. H. T. W.

Golovanoff (M.). **Sur la spécificité de l'antivirus cholérique.**—*C.R. Soc. Biol.* 1924. Dec. 27. Vol. 91. No. 37. pp. 1379–1381.

The author records experiments tending to prove that the protecting properties of the antivirus, obtained as a filtrate from cultures of *V. cholerae*, are specific—at any rate, for guineapigs. He writes: "Since the antivirus, issue of the bodies of the vibrios, could not act otherwise than the vibrios themselves, the immunity created by the latter after vaccination ought to be effected equally without antibodies." [It does not follow that the antivirus is the same in composition and properties as the protein of the bacillus forming the usual "vaccine." The antivirus, or, as some workers call it, the "bacteriophage" is evidently an excretion, or possibly only a refuse product of metabolism, poisonous for the *V. cholerae*. Many such poisons are found in the excreta and metabolic refuse in plants and in animals.] The author prepared filtrates from cultures of the pyocyanic bacillus, *B. proteus* and *B. prodigiosus*. Guineapigs injected with these filtrates did not survive, except in a few cases, inoculation of a lethal dose of *V. cholerae* given 24 hours later. The controls protected with *V. cholerae* filtrate lived after similar treatment.

J. H. T. W.

KEPINOW (Léon). **Immunité non spécifique et fugace. Action immunisante des filtrats bactériens spécifiques, et non spécifiques, sur l'infection cholérique.**—*C.R. Soc. Biol.* 1924. Dec. 27. Vol. 91. No. 37. pp. 1374–1376. [1 ref.]

The views of this author and the results recorded are a direct contradiction of those noticed in the paper by GOLOVANOFF—see above [see this *Bulletin*, Vol. 21, p. 888].

J. H. T. W.

PRATT (W. W.). **An Examination of Twenty Strains of Vibrio isolated from Cholera Cases.**—*Jl. Roy. Army Med. Corps.* 1925. Jan. Vol. 44. No. 1. pp. 40–45. [7 refs.]

This work was undertaken with a view to establishing the serological identity of a number of strains. The twenty strains, which came from Calcutta, Constantinople, Mysore, etc., are enumerated, with tabulated reactions (3 Tables). All the vibrios examined agree in the following particulars :—

(1) They are non-haemolytic.

(2) They have one terminal flagellum.

(3) They have similar biochemical reactions as far as these were examined. They all liquefied gelatin, and gave the cholera-red reaction.

There appear to be two serological groups. These types may or may not be distinguishable by agglutination tests only, according to the serum used. They can be distinctly defined by absorption tests. This work emphasizes the importance of using a suitable antigen for preparing agglutinating serum. If only one serum be used for diagnostic purposes it must have the property of agglutinating all strains.

J. H. T. W.

BRUTSAERT (Paul). **La constitution antigénique des vibrions du choléra.**—*C.R. Soc. Biol.* 1924. Nov. 28. Vol. 91. No. 33. pp. 1157–1159. [6 refs.]

As the result of these experiments in which rabbits were injected with emulsions of *V. cholerae* (1) simply killed by heat at 56° C. and (2) heated at 100° C. for two hours, the author states : "Our anti-cholera vibrio serums obtained by injection of Koch's vibrios heated during two hours at 100°, agglutinated our different strains of cholera vibrios, whether they were heated to 100° or not, quite as well as anti-serums of 56° prepared at the same time. As absorption trials confirmed the agglutination experiments, we state that all their antigen is thermostable."

J. H. T. W.

FUJII (S.). **Findings of an Experimental Study of the Kidney affected by Cholera Toxin.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 209–227. With 1 plate. [29 refs.]

The plates show the condition of the kidney 12 hours and 7 days after injection of cholera bacilli emulsion. The details of the various

experiments cannot be condensed, but we give the author's "Conclusions":—

There is no theory that can satisfactorily explain the anuria in cholera. Theories are based on postmortem observations without supplementing the facts by experimental pathology. In my experiments the cholera toxin early brings forth . . . nephrosis of the urinary canaliculi, and then causes glomerular nephritis . . . The granular degeneration of the tubuli contorti is seen very early and reaches its height 8 to 24 hours after injection, when the interior of the canaliculi become almost obliterated. The kidney gradually becomes anaemic and finally bloodless. Turbidity and swelling then decreases by degrees. The cellular protoplasm turns into a granular substance, which is well stained with eosin, and serous substance. They stay in the shape of drops in the tubuli contorti. Later on they are discharged into the tube while the height of the cells decreases and the urinary canal becomes wide. Then the blood in the kidney either becomes normal again or it is in a state of congestion or haemorrhage.

J. H. T. W.

Acton (Hugh W.) & Chopra (R. N.). **The Nature and Pharmacological Action of Cholera Toxin.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 235–249. With 10 graphs. [4 refs.]

The details of investigation in this paper cannot be satisfactorily condensed; but the results obtained are fully shown in the "Conclusions":—

The cholera vibrio, as we know, can liquefy gelatine, and reduce the amino-acid trytophane to indol. We now show that it can also decarboxylate amino-acids into poisonous bases.

The protein bases found in a 10-days cholera broth culture consist of two main fractions, volatile and non-volatile bases. The volatile bases are almost devoid of pharmacological activity on the tissues tested, but they cause a tonic contraction of the rabbit's intestine.

The non-volatile bases contain the poisonous toxins, which depress blood pressure, etc. These poisonous bodies are found in the arginine fraction of the non-volatile amino-acids, so that they only form a small proportion of the non-volatile bases. The main actions of these toxic bases are: (1) A fall of blood pressure due to vasodilatation of the vessels supplying the small intestines, combined with an increased permeability of the vessel endothelium; (2) direct action on the secreting tubules of the kidney which are further hampered by the occurrence of an intertubular oedema as soon as the blood pressure rises to normal; (3) an oxytocic action on the pregnant uterus, causing miscarriages.

The optimum conditions for the production of these bases are the necessary amino-acids, pH on the alkaline side, and a liberal supply of oxygen.

J. H. T. W.

van Loghem (J. J.). **Exo-haemolysine en endo-haemolysine bij vibrio Tor en vibrio cholerae.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 9. 68th Year. 2nd Half. No. 6. pp. 773–776. [5 refs.]

Concerning the action of bacteria on blood, a distinction is made between haemodigestion, *i.e.*, digestion of the components of the blood and haemolysis, *i.e.*, the expulsion of haemoglobin from the

erythrocytes. Erythrocytes of goat's blood are not haemolysed by *Vibrio cholerae* within 24 hours; they are by V. "El Tor," likewise by *V. cholerae* within a period exceeding 24 hours, but the clear zone surrounding the colonies in solid media has been shown no longer to contain oxyhaemoglobin (as is the case around colonies of V. El Tor) indicating that not haemolysis but haemodigestion has set in.

N. H. Swellengrebel.

PEVERELLI (P.). **De vaccinatie tegen cholera langs den weg van het darmkanaal.** [Vaccination against Cholera by the Way of the Intestine.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 2. 68th Year. 2nd Half. No. 5. pp. 638–640.

Confirmation of BESREDKA's observations that normal rabbits are insensitive to large doses of living or killed cholera-vibrios in their intestinal canal, but that various antibodies appear in their blood serum (agglutinins, bacteriolysins and bodies fixing complement) if bile (of oxen) is given before the bacterial dose. The dose in this case produces an often fatal enteritis. The post-mortem findings show a strong hyperaemia, notably of jejunum and ileum, the contents of which are fluid, often bloody, and the vibrio is found in the gut, and often in the gall-bladder. The bactericidal action of the gutwall is not found in the sterile fluid expressed from its tissue. Rabbits vaccinated in this way were usually resistant to an intravenous dosis of vibrios, fatal to untreated rabbits. Some of them, however, died sooner than the control-animals; whether this is to be regarded as a phenomenon of anaphylaxis, or caused by liberation of an excess of endotoxins, remains undecided.

Vaccination of two sets of 7 men, the one set receiving a tabloid containing 200 milligrams of desiccated bile together with one containing desiccated cholera-vibrios on three succeeding mornings before breakfast, the other set receiving no bile, showed that all of the first and one person of the second set had produced agglutinins, indicating resorption of the vaccine, for which the addition of the bile is, consequently, not absolutely indispensable.

N. H. Swellengrebel.

OYAMA (Ryo). **[A Comparative Study on the Production of Anti-Bodies by *Vibrio cholerae* having Different Magnitudes of Virulency.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. May. No. 338. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 300.]

In the present experiments with cholera vibrios the author found that under similar conditions there occurred no differences in the amount of antibodies produced by different strains of vibrios having different virulency. The amount was exclusively determined by the bacterial body itself. Their biological characters had no concern with the production of such divergent amounts of the antibodies. The efficacy of the antibody production by a given strain should be determined by the estimation of the produced antibodies in the serum immunized with that special strain of the vibrio.]

J. H. T. W.

Satomi (Mitsuwo) & Hirakawa (Hiroshi). [**On the Hemolytic Action of Cholera Vibrio against the Erythrocytes of Various Species of Animals.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc.*). 1924. June. Vol. 18. No. 7. [Summarized in *Japan Med. World.* 1924. Nov. 15. Vol. 4. No. 11. p. 299.]

The authors concluded that the haemolytic power which the cholera vibrio possesses did not act always against all kinds of animals; wide specific differences were met with.

J. H. T. W.

Ohwada (Seijitsu). [**Destination of Cholera Vibrios in the Sewage Water of Tokyo City.**]—*Keio Igaku Zasshi* (*Jl. Kei-O Med. Soc.*). 1924. Feb. Vol. 3. Nos. 11/12. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. pp. 206–207.]

The author mixed cholera vibrios in crude and purified sewage water from Tokyo city in order to determine how long they would live. In crude sewage water they lived for 9 days and in the purified water 8 days. [See this *Bulletin*, Vol. 18, pp. 356–357 (Flu).]

J. H. T. W.

Matsuo (Takeaschi). [**On H-ion Concentration of the Medium for the Cultivation of** *Vibrio cholerae.*]—*Tokyo Iji-shinshi* (*Tokyo Med. News*). 1924. Aug. No. 2384. [Summarized in *Japan Med. World.* 1924. Dec. 15. Vol. 4. No. 12. p. 326.]

The author tested the optimal H-ion concentration of the culture medium for *V. cholerae* and found that one having pH of 9·5 was the best. [*cf.* this *Bulletin*, Vol. 21, p. 74 (Kabelik and Freudmann).]

J. H. T. W.

Prausnitz (Carl) & Hille (Georg). **Die Vibriolyse ausserhalb des lebenden Körpers.** [Vibriolysis outside the Living Body.]—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Dec. 5. Vol. 93. No. 6. pp. 480–485. [4 refs.]

The finding of vibriolysins in man and laboratory animals is not new. The authors give a reference to Pfeiffer, 1894. See also "Studies in Immunization," 1909 (Almroth Wright), p. 45 (Wright & Windsor, 1901–1902).

J. H. T. W.

Heggs (T. Barrett). **Cholera in Baghdad.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 15. Vol. 27. No. 8. pp. 85–91.

Iimura (Yasuzo). **The Occurrence and Prevention of Cholera in Japan.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore.* 1923. pp. 711–724. With 1 chart & 1 map.

——. **The Prevention and Occurrence of Cholera in Japan.**—*Japan Med. World.* Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9 & 10. pp. 217–222.

Okolska (Marja). **O tak zwanej epidemji cholery w Baranowiczach w roku 1922, wraz z uwagami o badaniach na nosicielstwo. Etudes sur l'épidémie de cholera à Baranowicze en 1922 et sur les porteurs des germes.**—*Medycyna Doswiadczalna i Społeczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 353–359.

Patel (Purshotamdas T.). **Some Observations on the Cholera Epidemic in Bombay, 1923.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 552–554.

Sanarelli (G.). **Patogenesi del colera (VIIIa Memoria). L'algidismo colerico.**—*Ann. d'Igiene.* 1924. Jan. Vol. 34. No. 1. pp. 1–29. [23 refs.]

ENTERIC FEVERS.

FLETCHER (William) & LESSLAR (J. E.). **A Case of Typhoid Septicaemia without Typhoid Ulcers.**—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 29–31. [2 refs.]

The patient, an old Chinese labourer, was admitted to hospital at Kuala Lumpur, March 11th, 1922; Temp., 103° F.; ill one month. There were no physical signs of disease except a few coarse râles over the lungs. For the first ten days the temperature ranged between 99° and 103° F.; during the following week it was seldom more than 100° F. After the patient had been six days in hospital he began to pass dysenteric stools containing blood and mucus. He died on April 1st. On March 20th his blood was sent to the authors for examination. It agglutinated an emulsion of *B. typhosus* 1 : 7,000. *B. typhosus* was cultivated. Stools which contained blood and mucus were examined on March 22nd, 27th, 28th and 29th, and dysentery bacilli of the Flexner group—Andrewes' type X—were found on each occasion. After death widespread dysenteric lesions were found, involving the whole of the large intestine and the last six inches of the ileum. No typhoid ulcers were found, nor enlarged Peyer's patches. There were two scars, not of recent origin, just above the ileo-caecal valve. The gall-bladder was thickened and *B. typhosus* was grown from it in pure culture. Two strains of the typhoid bacillus were isolated from the patient's blood and his serum agglutinated a stock emulsion of *B. typhosus*. Subtertian malaria parasites were found in the same patient [*cf.* this *Bulletin*, Vol. 12, p. 390 (DE VEZEAUX, DE LAVERGNE & GAUTIER)].

J. H. Tull Walsh.

DE CASTRO (A. Bayley). **Marris' Atropine Test in Typhoid Fever and its Value.**—*Indian Med. Gaz.* 1924. Oct. Vol. 59. No. 10. pp. 510–511.

The author describes the test and gives details of cases in which atropine was used for diagnosis. There were no unpleasant results, and the author considers the test excellent for diagnosing typhoid fever [see this *Bulletin*, Vol. 12, p. 390 (FRIEDLANDER & MCCORD); Vol. 9, pp. 466–468 (MARRIS)].

J. H. T. W.

CRUZ (Juan Z. Sta.). [In English & Spanish.] **Autopsy Incidence and Pathological Lesions of Typhoid Fever in the Philippine Islands. La fiebre tifoidea en Filipinas su frecuencia en la autopsia y sus lesiones pathologicas.**—*Jl. Philippine Islands Med. Assoc.* 1924. June. Vol. 4. No. 6. In English pp. 209–214. [13 refs.] In Spanish pp. 238–242.

HIRST (L. Fabian). **On the Parenteric Fevers.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1924. Sept. Vol. 21. No. 2. pp. 72–83. With 1 chart.

JOURNAL OF THE PHILIPPINE ISLANDS MEDICAL ASSOCIATION. 1924. Sept. Vol. 4. No. 9. pp. 341–345.—**The Typhoid Fever Problem in the City of Manila. Report of the Council of Hygiene.**

MAKALINTAL (Ambrosio J.). [In English & Spanish.] **Clinical Study of Typhoid Asthenia. Estudio clinico de la astenia tifodica.**—*Jl. Philippine Islands Med. Assoc.* 1924. June. Vol. 4. No. 6. In English pp. 219–223. [4 refs.] In Spanish pp. 245–248.

MALARIA.

SWELLENGREBEL (N. H.). **De reis der malaria-commissie van den volkenbond naar Oost-Europa en Italië.** [The Visit of the Malaria Commission of the League of Nations to Eastern Europe and Italy.]—*Nederl. Tijdschr. v. Geneesk.* 1925. Jan. 10 & Jan. 17. 69th Year. 1st Half. Nos. 2 & 3. pp. 139–152; 218–228.

The distinguished Commission visited Croatia, Dalmatia, Serbia, Macedonia, Bulgaria, Roumania, Russia including the Ukraine and Moscow, and Italy. For each country there are considered the anti-malarial organization and its cost, the parasite and spleen indices for several years, checked in certain instances by the Commission's own examinations, but mostly mentioned without reference to season. There is much information regarding the incidence of the three kinds of malaria in various parts of the field covered.

The reality of congenital malaria finds much support. In Skradin, Dalmatia, 40 cases are reported in which parasites were found 1 to 5 days after birth. From Persianovka (Don) it was reported that parasites were found within 2 days after birth in 8 cases, and at Zarizyn (Volga) in the blood of mother and child as well as in that of the umbilical cord. It is insisted that infection from *A. maculipennis* is acquired in a house only, and that the likelihood of infection is increased in proportion as houses are more crowded and mosquitoes less harassed.

Clayton Lane.

PITTALUGA (G.). **Observaciones sobre el paludismo en la Macedonia griega.** [Malaria in Grecian Macedonia.]—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 131–157.

This is from the report of the visit of the Malaria Commission of the Sanitary Committee of the League of Nations. Greece has attacked, with the energy and skill compatible with a minimum of material, the problem thrust upon her by the arrival of a million refugees, for her facilities bear poor comparison with those at the disposal of more fortunate Jugo-Slavia. The problem of the colonization of the valleys of the Sturmar and Vardar demands large sanitary works such as Italy has successfully carried through and watchfully maintains.

C. L.

DE BUEN (Sadí) & LUENGO (Emilio). **Contribución de la Sección de Parasitología en la campaña antipalúdica (año 1923).**—*Arch. Inst. Nac. Higiene de Alfonso XIII.* 1924. Oct. Vol. 3. No. 3. pp. 159–202. With 3 charts. [5 refs.]

A large amount of work done in Spain during 1923 shows for the places investigated a splenic index as high as 58·8, and heavy infection with all three species of malaria parasites, the subtertian being sometimes, as at San Pedro del Pintar, more prevalent than the tertian. Anophelism is marked, breeding occurring in seepage pools from canals and wells. Breeding of Gambusia has been continued, and some thousands of trees planted.

C. L.

Ioff (I.). **Die Arbeiten in der Malariabekämpfung des Instituts für Mikrobiologie und Epidemiologie des Südostens Russlands.** [Anti-malarial Work in the Institute of Microbiology and Epidemiology of South-East Russia.]—Communication à la Conférence internationale sur le paludisme organisée par le Comité d'Hygiène de la Société des Nations.—4 pp. 1924. Saratov.

The recent pandemic of malaria in this part of Russia (this *Bulletin*, Vol. 21, p. 291) is considered and recent publications of the Institute enumerated. The maximum incidence of tertian malaria occurs in May, of sub-tertian in September, and of quartan in November; the last, taking place at a period when mosquitoes are held to be entirely absent, is judged indicative of an incubation period of 2 to 3 months. [It will, however, be remembered that Mackenzie (*l.c.*) reported that Anopheles bred throughout the winter in the almost tropical temperatures maintained in the waterbutts within the houses.]

C. L.

Kligler (I. J.), Shapiro (J. M.) & Weitzman (I.). **Malaria in Rural Settlements in Palestine.**—*Jl. of Hyg.* 1924. Dec. Vol. 23. No. 3. pp. 280–316. With 4 plates, 5 charts & 1 map. [18 refs.]

Statistical and laboratory data show that in Palestine the malaria incidence lies between 50 and 100 per cent. of the population, *P. vivax* constituting 98 per cent. of the February to June epidemic, and *P. falciparum* 40 to 50 per cent. of that from October to December. High malarial incidence shows itself as a high parasite index in children, while both in adults and children the splenic index is high. With control it is naturally the parasite index which first falls; with recrudescence, in spite of control, children show the first rise in these indices. Parasites were detected in 5 per cent. of Jews, as compared with 15 per cent. of Arabs, for the former seek medical aid more freely and indices are the evidence of the balance between infection and cure. A quinine treatment is described, and is compared with one using a slightly smaller dosage of quinidine. The results were almost identical.

C. L.

Swellengrebel (N. H.). **Malaria in the Kingdom of the Netherlands. Report to the Malaria Sub-Committee of the Health Committee of the League of Nations.**—72 pp. With 9 graphs. League of Nations. Health Organisation. C.H. 196. [Proof.]

Experience in Holland of checking clinical diagnosis by blood examination leads to the emphatic refusal to regard the former as being of any value. Accordingly, the previous records of malaria in Holland, whether of the prestatistical or statistical era, cannot be accepted. Compulsory notification, which leaves the medical man free to make his own clinical diagnosis, will produce figures, but figures as worthless as the malaria statistics of former years. Gametes are not held to indicate relapse, for they were found in 56 per cent. of febrile persons who had had no evidence of malaria during the last 2 years, and in 75 per cent. of those who had.

Renewed anopheline activity takes place after 1st June, but many "primary" cases occur before that date. They are explained partly

by latency from the previous autumn, partly by the fact that in the Netherlands hibernation of mosquitoes is not complete, bloodfeeds and development of oocysts occurring in stables throughout the winter. Accordingly the tedious and expensive task of detecting gamete carriers on a mass scale in early spring is held useless. No vegetation was found which could be relied upon to prevent larval development of *A. maculipennis*. Heavy shadow does so. It is emphasized that gametocytes of *P. vivax* disappear rapidly under quinine.

C. L.

i. Bass (C. C.). **The Relation of the Malaria-Carrier to Malaria Prevalence.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 61–66. [2 refs.] [United Fruit Company, Boston, Mass.]

ii. James (William M.). **The Localization of Malarial Parasites in Man.**—*Ibid.* pp. 67–70.

i. Countless examinations having failed to implicate animals, even as non-optimum hosts of man's malaria parasites, and having proved that every infected host may at one time have no gametocytes, at another many, in the cutaneous blood, it follows that every infected person must be looked upon as an actual or potential disseminator. It is then essential that disinfestation should be attempted for all. The claims of the Standard Treatment to leave but few carriers is urged, and the extent to which qualified and unqualified students of medicine are being educated in this respect is pointed out.

ii. James intimated that cerebral symptoms are no evidence of predominant cerebral localization of parasites, but rather prove toxaemia. The optimum habitats are the spleen and rib marrow, the latter particularly in the case of the gametocytes, and the placental sinuses in that of asexual forms of *P. falciparum*. Whether cerebral stasis due to actual mechanical blocking of capillaries really occurs is held questionable.

In discussion Stephens and Gordon Thomson emphasized that they always, and James that he almost always, found tertian gametocytes if parasites of that species were present at any stage of development. Stephens noted the frequent complete absence of crescents for 2, 3 or more weeks after infection, Thomson their complete absence in 100 adult Rhodesian negroes, and their simultaneous presence in 40 per cent. of their children. Clarke correlated localization of parasites with circulatory stasis, as in the sinuses of rib marrow, spleen and placenta, where they are found, not murally arranged, but scattered evenly throughout the channel. Thomson noted how in cultures parasites which develop beyond the ring stage tend to group themselves together and stick to endothelial cells. Castellani held that the *Plasmodium canis* of Ceylon is morphologically identical with *P. vivax*. Fülleborn indicated that without keenness of the inhabitants prophylactic quinine must be useless. Among other valuable points raised were the value of the thick film in nearly doubling the parasite rate (Clarke); relapse of malaria in England 7 or 8 years after leaving the Balkans (Castellani); the failure of quinine to cure where there is malnutrition (Carter, Harris, Stephens); the confusion of repeated relapse with repeated reinfection

(Connor); the relation of malaria to rainfall and ground water level (Rogers); the disappearance after death of parasites which "must have been present during life" (Thomson); the attempt to investigate the acquisition of immunity, hurriedly stopped by threatening mortality (Stephens); and the opinion that the development of gametocytes in benign tertian malaria takes 4, and in quartan 6 days, or double the length of the asexual cycle (James).

C. L.

Wootton (W. T.). **Family Physician versus Laboratory Diagnosis of Malaria.**—*Southern Med. Jl.* 1925. Feb. Vol. 18. No. 2. pp. 116–119.

The ordinary clinician, it is held, accepts a diagnosis of malaria according as the parasite is or is not found in one or more blood smears by a laboratory technician of unknown ability, perseverance and reliability. A questionnaire addressed to a number of widely distributed medical men in the South elicited great differences in view as to whether malaria could exist without parasites being detected in the cutaneous blood. Personal experiences suggesting or proving that this may be the case are added, and it is concluded that chronic malaria is an entity, and in the vast majority of cases can only be recognized clinically. It must then be dealt with empirically till such time as refinement in diagnosis is so developed as to make such a procedure unnecessary.

C. L.

Lefèvre (R.). **Note sur le paludisme au Soudan français (cercle de Mopti).**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 939–940.

Antilarval measures are held inapplicable to this islet lying in a sea of rice fields. The splenic index in children is 61, the parasite index, including all ages and presumably in thin film, is 21. All infections but one were with *P. falciparum*, the exception by *P. malariae*. Of 36 Europeans taking "quinine," 0·4 to 0·6 gm. daily, only two showed malaria. One held it a point of honour to substitute rum for quinine, the other admitted to taking it most irregularly.

C. L.

Christophers (S. R.). **The Mechanism of Immunity against Malaria in Communities living under Hyper-Endemic Conditions.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 273–294. With 1 text fig. [9 refs.]

The suggestion made (this *Bulletin*, Vol. 21, p. 284) that this valuable work deserved better editing and wider publication than it had hitherto received has happily been carried out. It is now explained how, by ascertaining the area of the preparation covered by the square aperture of the Ehrlich eyepiece with the combination of lenses in use, the volume of the blood examined can be obtained. In this way it is determined that the peculiar condition of a high percentage of infected adults with but few parasites per cc. appears to be a characteristic of acquired immunity or tolerance under hyper-endemic conditions. A spleen extending to 8 or 10 cm. from the umbilicus is associated with acute infestation, a larger one with a reduced parasite rate and some degree of acquired immunity. New

arrivals, whether by birth or immigration, into a hyper-endemic area, experience, as previously noted, a period of about 2 years during which "attack" conditions are present, with an average parasite count of 10,000 parasites per cmm. This is followed, as in childhood and adolescence, by one of "immune infestation." Crescents are associated with a high rate of schizonts, that is with "attack" conditions; their proportion in children to asexual forms is about 1 to 400; and their total number per cc. of blood was in these 2,095, as against 132 in an almost equal number of adults.

C. L.

Swellengrebel (N. H.). **Nadere bijzonderheden over de herfst- en winterbesmetting met malariaparasieten van** *A. maculipennis* **om Amsterdam.** [Particulars on the Autumnal and Hibernal Infection of *A. maculipennis* with Malaria Parasites around Amsterdam.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Aug. 9. 68th Year. 2nd Half. No. 6. pp. 750–763. With 1 chart. [8 refs.]

This paper records the results of dissection of 10,873 anophelines (9,549 for intestinal and of 1,324 for salivary infection) caught between January, 1920, and May, 1922, in houses in the malaria-districts around Amsterdam where malaria had been observed. The majority of infected insects was found from September till December and again (although in smaller numbers) in February; few or none were found in summer, although May-July marks the apex of the malaria-curve. This is explained by the fact that in autumn and winter the individual anophelines remain in the houses, and if they become infected, are to be found there, whereas in summer they leave the houses to deposit their ova and may not come back, though plenty of fresh new-hatched individuals may take their place. This should be taken into account in all speculations on the influence of meteorological conditions on malaria.

The rate of infection with oocysts reached 5·7 per cent. in autumn, 1920, and 6·2 per cent. in autumn, 1921. In peasants' houses with adjoining stables, where the numbers of anophelines caught in the sleeping rooms was much higher than in urban-habitations, the rate of infection was not lower, even somewhat higher, than in the latter (2–10 per cent. and 4–11 per cent.), the absolute number of infected mosquitoes being much greater. Instances are given of examination of succeeding catches in the same house, showing that it is much more difficult to get rid of the infected mosquitoes in the peasant-homes than in the urban-houses, the construction of the former providing the anophelines with much better shelters.

A portion at least of the infected anophelines show sporozoites in their salivary glands in November-March, which they may inject into humans as they continue to suck blood in winter. If these sporozoites be still viable, infection of the victims must take place, and this may explain the primary cases occurring in early spring (Korteweg).

N. H. Swellengrebel.

Grassi (B.). **Reviviscenza temporanea della malaria in Toscana.**—*Ann. d'Igiene.* 1924. Feb. Vol. 34. No. 2. pp. 81–91.

Three marshy provinces of Tuscany, formerly markedly malarious, have been since 1901 classical instances of anophelism without malaria.

Probably as the result of infected, returning, soldiers, parts of this territory have become intensely malarious, so that in January, 1922, 64 per cent. of the population were found infected. Of 444 inhabitants of Stagno, 71 took prophylactic quinine regularly with no primary case; 373 did not, with 13 primary cases. A case was classed as primary if it showed itself in the pre-epidemic season. Relapses were reduced from 716 in 1922 to 195 in 1923. Of the cases occurring in the pre-epidemic season, one who had taken quinine in the previous year is judged to be primary. Blood examination, practised in many instances, showed but one case not of benign tertian malaria, and that film contained crescents. Quinine was effective in doses which about Rome would have been useless. The author, considering that the phase of intensive malaria of former times lasted many years and that malaria expanded very much, while this time malaria has disappeared almost entirely without spreading itself, comes to the conclusion that certainly the quinine had been of good use, but that also the mysterious " genius loci " must have been helpful.

C. L.

Cignozzi (Oreste). **La grossa milza malarica nell' etiopatogenesi dell' appendicite.** [An Enlarged Malarial Spleen in the Causation of Appendicitis.]—*Riforma Med.* 1925. Jan. 12. Vol. 41. No. 2. pp. 32–34.

It is stated that appendicitis and malaria occur in Maremma equally in spring and autumn; that about 85 per cent. of appendicitis cases have had malaria, and that in 90 per cent. of these the spleen is enlarged; that this enlargement, by compressing the colon, induces distension of the ascending colon and caecum; and that the consequent constipation and congestion, constantly recurring, induce appendicitis and periappendicular lesions. In which case appendicitis should surely fill all tropical hospitals.

C. L.

Antić (D.). **Immunität der Malariker gegen Superinfektion.**—*Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 28. Vol. 94. No. 2. pp. 134–137.

The writer adds two to the reported cases of failure of a second injection of blood containing *P. vivax* to produce reappearance of the parasites in the cutaneous blood, a first injection having induced infection, and treatment of that infection having ceased sufficiently long for there to be no persistence of quinine excretion.

C. L.

Affre (M.). **Le paludisme dans les suites de couches.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 110–116. With 2 figs.

In Dakar malaria constantly appears after labour, benign in character, although caused by *P. falciparum*. The lochia disappear. Lactic secretion is interfered with. Oral treatment with quinine is effective.

C. L.

JONES (J. Llewelyn) & BROWN (H. C.). **A Case of Congenital Malaria occurring in England.**—*Lancet.* 1924. Nov. 22. p. 1058. [8 refs.]

The mother, who had never travelled further east than Venice, had irregular fever during the last 2 months of pregnancy. It rose to 104° on the day after her delivery in Buckinghamshire, the blood showing a heavy benign tertian infection. The child's temperature rose for the first time on the 16th day. When examined, its blood showed the same infection with numerous gametocytes. In the absence of the known local presence of Anopheles, and of information regarding the possibility of transmission of infection through milk, the most obvious conclusion is held to be a congenital infection. The time of year is not noted.

C. L.

SINTON (J. A.) & HUGHES (T. A.). **The Functional Capacity of the Liver in Malaria, with Special Reference to the Levulose Tolerance Test.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 409–422. [73 refs.]

A convincing citation of the findings of those who have studied the question shows that a satisfactory glycogen reserve is necessary for the proper carrying out of all liver functions; that the glycogenic function is disturbed in some acute attacks of subtertian malaria of ordinary severity, and is probably more interfered with in pernicious onsets. These considerations suggest that ingestion of glucose or levulose is indicated in all cases of malaria.

C. L.

MONTELEONE (R.). **Contributo allo studio della funzionalita' epatica nella malaria acuta e cronica.**—*Problemi d. Nutrizione.* Rome. 1924. July. Vol. 1. No. 7. pp. 381–389. [14 refs.]

Blood examination of 275 cases of tertian, subtertian and quartan with a few of chronic malaria leads to the conclusion that bile pigment is present in 6 and urobilin in 95 per cent. Glycogenic function is altered in 30 per cent., proteolytic in 60, antitoxic in 50, the fat metabolism in none.

C. L.

RUDOLF (G. de M.). **Spontaneous Splenic Rupture in Malarial Treatment.**—*Lancet.* 1924. Nov. 22. p. 1057. [13 refs.]

Le Scalpel having recorded a case where a general paralytic, after experiencing 8 rigors from artificially induced malaria, died in bed of a ruptured spleen, Rudolf compares the spleen of general paralytics with non-paralytics with a view to determining whether its structure suggests a greater likelihood of rupture. The conclusion is that the syphilitic spleen is apt to be fibrous, and so less liable to rupture when distended than is the normal one.

C. L.

SERGENT (Edm. & Et.), PARROT (L.), FOLEY (H.) & CATANEI (A.). **De l'emploi de la quinine contre le paludisme.**—*Bull. Soc. Path. Exot.* 1925. Jan. 14. Vol. 18. No. 1. pp. 28–32. [3 refs.]

The experience of these writers leads them to the following conclusions. Therapeutic quinine should ordinarily be given by mouth in doses not exceeding 2 gm. daily, intravenous injection being reserved for pernicious attacks. Intramuscular quinine should not exceed 3 per cent. in strength. Prophylactic quinine is no absolute protection against infection, but renders attacks mild and should be taken daily. It renders the recipient less dangerous to his fellows. Mass prophylactic quinine is automatic, sufficiently effective, not troublesome, and readily accepted. A special administrator enters into the scheme.

C. L.

DEEKS (W. E.). **Prevention and Treatment of Malaria.**—*Jl. Trop. Med. & Hyg.* 1925. Jan. 15. Vol. 28. No. 2. pp. 21–26. [3 refs.]

Considering two recent papers by Warrington YORKE & MACFIE, and by HANSCHELL (*ante* pp. 50 and 60), Deeks adds these facts. In Panama the treatment found most efficacious for acute cases was 15 grains of quinine three times a day during fever, and thereafter 10 grains three times a day for 5 days. Relapses were greatly lessened. For chronic cases the treatment of concomitant infections such as syphilis and ankylostomiasis is held essential, the value of arsenic being attributed to its influence on syphilis. Measures reasonable for the handling of labour camps in malarial regions are described, the continuous issue of prophylactic quinine to all persons being held justifiable only if a high percentage of infection and many mosquitoes are both existent.

C. L.

SEGUIN (T.). **Du traitement du paludisme, maladie essentiellement curable. (3e Communication.)**—*Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 660–692.

Seguin returns to the theme (this *Bulletin*, Vol. 21, p. 853) that malaria is always and everywhere easily curable in doses of 5 cgm. per kgm. for 3 days during fever, and of 3·75 cgm. per kgm. thereafter for 10 days, corresponding in an ordinary individual to about 40 and 25 grains daily. If gametocytes have appeared, the treatment must be continued for 60 days. Where fever has reappeared no explanation is accepted other than that it is a reinfection. Under no conditions, it is held, does quinine produce digestive disturbance or abortion.

A number of instances are quoted where adequate quinine dosage (which was evidently being withheld in the French Soudan for fear of blackwater fever) produced excellent results.

In discussion, MONTEL would limit oral administration to some rare cases of benign tertian malaria, substituting for ordinary use ABRAMI's dilute subcutaneous injections.

C. L.

HODSON (V. S.). **Individual Resistance in the Cure of Malaria.** [Correspondence.]—*Lancet.* 1925. Jan. 17. p. 156.

It is suggested that neither in "A Critical Consideration of the Treatment of the Malarias" (this *Bulletin*, Vol. 21, p. 849) nor in

the *Lancet's* leader thereon (Jan. 3rd, 1925) is sufficient weight given to individual resistance, it being held elementary that the severity of a disease varies with the relation of the "dosage" of the infection to the resistance of the individual. This is believed to have been lowered in war time not only by physical hardships, but by the ever present expectation of wounds and death; while in peace time the rare failure of treatment is attributable to faulty administration or to concomitant infections.

C. L.

HODSON (V. S.). **The Treatment of Malaria.**—*Jl. Trop. Med. & Hyg.* 1924. Dec. 1. Vol. 27. No. 23. pp 321–322. [2 refs.]

In the belief that intermittent administration of quinine permits of the production of resistance, while its continuous administration does not, the drug is ordered in daily doses of 20 grains (1·3 gm.) on three consecutive days a week for 3 or 4 weeks; for the same period for 2 days a week; and finally also for 1 day weekly; beginning the course always on the same day of the week. No figures accompany the paper.

C. L.

REINHOLD. **Le traitement de la malaria par la quinine alcaline de Sinton.**—*Bruxelles Méd.* 1924. Dec. 28. Vol. 5. No. 9. pp. 313–314.

COL. J. L. BULTEEL, I.M.S., is reported as having treated 271 cases during a full year with SINTON's alkaline quinine mixture (this *Bulletin*, Vol. 20, pp. 300 and 971) with 28, or 10·33 per cent., of relapses. The amount of quinine used per case was 11·7 gm.

C. L.

PLEHN (A.). **Zur Frage der sogen. "Chiningewöhnung."** [On Quinine Habituation.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 538–539.

A man taking in Westphalia since childhood 0·6 gm. of quinine daily for one month in every four, was taken prisoner on the German eastern front and sent to the Southern Urals and Siberia. He developed fever and was dosed with a teaspoonful of quinine three times a day. An attack of blackwater supervened, but quinine was later continued in half teaspoonful doses, and afterwards 2·4 gm. daily, during which latter period urinary excretion lay between 0·012 and 0·103 gm. daily. He stated that quinine had no ill effects on him and that without it he was weak and useless. Yet PLEHN reduced it to 0·5 gm. daily. Malaria parasites were never found. Perusal of this *Bulletin* (Vol. 21, pp. 292 and 298) increases the natural doubt whether the enormous doses received really were unadulterated quinine.

C. L.

MACPHAIL (N. P.). **Administration of Quinine in Acute Malaria, with Special Reference to the Value of Intramuscular Injections.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 89–95. (Discussion, pp. 95–109.) [United Fruit Company, Boston, Mass.]

This paper and its discussion are markedly important. Macphail shows that those who received quinine in solid form either as powder,

capsules or friable tablets required, less frequently than did those who received the solution, the use of those intramuscular injections with which he treats all, or practically all, his grave cases. The series covered 2½ years, thus excluding seasonal influence. Regarding intramuscular injections the paper and discussion show the usual marked divergences of opinion, which indicate perhaps a general failure to realize that skilled experience can only differ so emphatically because there are unknown factors whose very existence is not realized. Macphail, Agramonte and Deeks urged that necrotic abscess is avoidable, by use of the bihydrochloride, by complete asepsis, by slow injection, by thorough massage and the use of a hot bottle, single injection of 15 to 22½ grains taking up 15 minutes of a nurse's time. Bass was gravely impressed by the damage, experimental and clinical, which quinine inflicts upon the tissues, and by the uncertainty of its absorption therefrom. Cran mentioned 15,000 intramuscular injections given by Macphail's dispensers with practically no necrosis. Bass urged that, by the evidence, intramuscular quinine is absorbed more slowly than it is by the mouth. James and Macphail note that for cases grievously ill in the bush an intramuscular injection by a dispenser will enable them to reach a doctor alive and better, instead perhaps of dying by the way. The risk of tetanus is held negligible. Those not using intravenous quinine much are more impressed with its difficulties than those who do. The value of friable tablets as against the too common stony ones, and the fact that quinine given twice daily (20×2 grs.) proved as efficacious as when given three times (15×3 grs.) are stressed.

C. L.

Murphy (R. A.). **Intramuscular Quinine.** [Correspondence.]—*Indian Med. Gaz.* 1925. Jan. Vol. 60. No. 1. pp. 48–49.

As a protest against a "stunt" revival by the *Indian Medical Gazette* of the dangers and inutility of intramuscular injections of quinine is lodged the statement that the writer has given many such with happy results, and is giving more as his experience increases. Risk of ill effects with proper precautions is held negligible. The arm should never be used. An editorial note, while agreeing that the arm should not be used, instances a recent death from tetanus where every possible precaution had been taken to insure sterilization.

C. L.

Stern (E.). **Ueber Glutealabszesse nach intramuskulären Chineinspritzungen. Erfahrungen gesammelt in Palästina.** [Gluteal Abscess after Intramuscular Quinine Injection. Palestine Experiences.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 69–72.

This statement merits attention. When quinine was intramuscularly injected during high fever Stern practically never got abscess or necrosis. If injected between febrile attacks he could practically always recover masses of quinine crystals from the necrotic mass which resulted.

C. L.

Acton (Hugh W.) & Chopra (R. N.). **The Local Effects produced in the Tissues by Intramuscular Injections.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 251–255. [4 refs.]

The vigorous language in which the conclusions are expressed should not distract attention from the striking results of the experiments recorded. When intramuscularly injected into rabbits the double tartrates of potassium and sodium produced extensive subcutaneous and intramuscular oedema, friability, widespread hyperaemia, punctate haemorrhage, but no necrosis. Emetine hydrochloride produced no hyperaemia, slight oedema, but extensive petechial haemorrhage. Quinine bihydrochloride caused slight hyperaemia and haemorrhage, extensive oedema, but necrosis with the alkaloid precipitated as a fairly soluble base. The acid salt, injected into the alkaline tissues of the body, has a pH of 7·2 to 7·4, and is precipitated as base with a solubility of 1 in 2,000, an acid radicle being liberated.

As to whether base or acid is responsible for the necrosis :—

A third of a cc. of hydrochloric acid having the same pH as quinine bihydrochloride, namely, 1·17, produced slight muscular oedema and no necrosis. Eighty mgms. of quinine or quinidine base suspended in 1 cc. of normal saline produced a good deal of necrosis, some ecchymosis, and slight oedema. Indeed, all four cinchona bases produced necrosis with but little to choose between them.

"To bury the needle deep in the muscles and fondly imagine that no injury to the tissues occurs is similar to the illusion which affects the ostrich when it buries its head in the sand. The injection of these alkaloidal salts into the muscles of man should be considered as malpraxis. There is only one method of administering the cinchona alkaloids, and that is by mouth. Very rarely in grave cases, *e.g.*, cerebral malaria, when an immediate action is required, quinine base should be injected intravenously.

Three deaths from tetanus, the result of intramuscular injection, are recorded, one particularly striking, since the syringe had two minutes' boiling. But the altitude was 6,000 feet and the boiling point only 94° F., at which temperature tetanus spores are not killed within two minutes.

C. L.

Stradomsky (Boris). **Ueber die Behandlung der Malaria mit intravenösen Chinininjektionen.** [Treatment of Malaria by Intravenous Injection of Quinine.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Nov. Vol. 28. No. 11. pp. 488–495.

224 persons were treated with 1,703 injections, the average number for cases of benign tertian malaria being about 6, of subtertian and mixed malaria about 10, and of quartan malaria about 13. The amount and spacing of the bihydrochloride seem to have varied considerably, and thrombosis of the punctured veins not infrequently necessitated the continuing of the treatment by mouth. Abscess formation twice occurred in the early days. The courses varied from 1 to 4. Of cases who had gone through one course 77 per cent. of those followed up relapsed, of those undergoing 2 courses 92 per cent., and of three or four 100 per cent. Of those treated in autumn 82 per cent. had relapsed by the following spring. The average interval between treatment with one course of injections and relapse was, in the autumn 170 days, but in the spring only 10·8 days. Similarly, subtertian cases treated in the autumn were apt to "relapse" in the

spring as tertians. If quinine were given on the fever-free day of a benign tertian malaria the paroxysm due next day was cut out in 85 per cent. of 60 cases; while in 25 cases of oral administration the figure was 64. The conditions of work did not exclude reinfection.

C. L.

SUZUKI (T.). **Cases of Malarial Fever treated per Rectum with Quinine.**—*Jl. Oriental Med.* 1924. Aug. Vol. 2. No. 3. pp. 233–238. With 3 charts.

Having established, so he notes, that the lethal dose of quinine for rabbits was *per rectum* about half that *per os*, Suzuki has consistently advised the former route, and here gives three illustrative cases treated after detection of plasmodia.

C. L.

SERGENT (Etienne). **La cinchonidine et la splénomégalie d'origine paludéenne.**—*Arch. Inst. Pasteur d'Algérie.* 1924. June. Vol. 2. No. 2. pp. 178–180. [2 refs.]

Prompted by experiments showing that cinchonidine (this *Bulletin*, Vol. 21, p. 290) like quinine (Vol. 17, p. 308) lessens splenomegaly in bird malaria, 12 splenomegalies in man were treated with hydrochloride of cinchonidine at the rate of 40 cgm. daily for an adult; 8 controls being treated with quinine sulphate, presumably in the same doses. The former gave better results than the latter. That the splenomegaly was malarial was accepted on clinical grounds.

C. L.

MARCHOUX (E.). **Action de l'arsenic sur le paludisme à** *P. vivax.*—*C.R. Acad. Sci.* 1925. Feb. 23. Vol. 180. No. 8. pp. 617–618. [1 ref.]

To 44 persons, 19 showing *Plasmodium malariae*, 13 *P. falciparum* and 12 *P. vivax*, Marchoux administered stovarsol in 1 gm. doses, orally, subcutaneously, intramuscularly and intravenously. In every case *P. vivax* rapidly disappeared, the other forms being unaffected. In one man infected with both the tertian forms *P. vivax* disappeared, *P. falciparum* did not. The difference, it is pointed out, indicates a specific difference in the parasites.

C. L.

MARCHOUX (E.) & COHEN. **Le stovarsol est, contre le paludisme, au moins aussi actif que la quinine.**—*C.R. Soc. Biol.* 1925. Jan. 30. Vol. 92. No. 3. pp. 132–133. [4 refs.]

Sodium stovarsol given intravenously once in unstated dosage to each of 7 general paralytics into whom benign tertian malaria had deliberately been inoculated induced disappearance within 4 to 6 hours of mature schizonts and gametocytes, and within 24 hours of all stages. The effects upon disinfestation as judged by relapse are unknown.

C. L.

Duroeux (L.). **Traitement du paludisme par les sels arsenicaux. Les résultats de six années d'expérimentation.**—*Bruxelles-Méd.* 1924. Nov. 16. Vol. 5. No. 3. pp. 92–95. [4 refs.]

To some 24 cases, treated with arsenical salts and followed up for several years, are added three more, epileptiform, haemoglobinuric and larval, in two of which crescents, but apparently no rings, were seen. It is concluded that among the derivatives of 606, sulpharsenol, the least toxic, is the most active, particularly against malaria, for which it should be given in small daily injections.

C. L.

Walker (J.). **Die Behandlung von Malaria mit Peracrina.** [Treatment of Malaria with Peracrina.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Dec. Vol. 28. No. 12. pp. 540–570. With 8 charts in text. [15 refs.]

Peracrina is a mixture of white of egg with trypaflavin. It is concluded from tests on 116 cases of tertian, subtertian, and mixed malaria that it is a specific which in many cases will replace and in the others will supplement quinine. Three cases are given in sufficient detail to enable the claims to be checked. In one, a primary benign tertian, plasmodia other than gametocytes persisted in the blood through 86 days of treatment, in a chronic tertian case for 51 days, and in a mixed tertian case for 58 days. Three deaths occurred.

C. L.

Sinton (J. A.). **Methods for the Enumeration of Parasites and Leucocytes in the Blood of Malarial Patients.**—*Indian Jl. Med. Res.* 1924. Oct. Vol. 12. No. 2. pp. 341–346. [4 refs.]

The various methods hitherto employed for estimating the number of malarial parasites in cutaneous blood are critically considered, particularly that of Dreyer for counting foreign blood cells. A suspension of fowl's erythrocytes in normal saline and mercuric perchloride (1 in 3,000) will suspend evenly and keep indefinitely. It is standardized to, say, 20,000 erythrocytes per cmm. Equal parts of blood and of this suspension are measured in a pipette and thoroughly mixed on a slide. After spreading and drying for 24 hours the preparation is stained with weak Giemsa. Over a large number of fields, using a square aperture, there are, separately counted, malaria parasites, fowl's erythrocytes, and, if desired, leucocytes. The formula $20{,}000 \times \frac{\text{number of parasites}}{\text{number of avian cells}}$ gives the number of malaria parasites per cmm.

C. L.

Barber (M. A.) & Komp (W. H. W.). **Some Modifications of the Thick Film Method in the Examination of Blood from** [*sic*] **Malaria Parasites.**—*Proc. Internat. Conference on Health Problems in Trop. America.* 1924. pp. 110–117. With 6 text-figs. [United Fruit Company, Boston, Mass.]

Of the Mass Diagnosis of the Malarias the following method is typical. Twenty-five slides, 3×1, each with a thick preparation at one end and a thin smear with the identification mark written in it at the other,

are so stacked that the thin ends overlie one another, and are kept apart by pieces of cardboard covering that half of the slide. A rubber band round this end of the stack keeps all together, the thick preparations lying free between the teeth of the "comb" so formed. The thick-preparation-half of the stack is immersed in clean water and then stained in good Giemsa solution, a strength of $1\frac{1}{4}$ to 75 cc. of water sufficing for 25 slides; the stack, moved once or twice, is left there for half an hour. These thick films were found reliable and time saving, confirmation by the thin film being, in fact, found unnecessary. CLARK noted that the thick film gave him 45·8 per cent. of positives, as against 17·5 with the thin. STEPHENS, W. M. JAMES and JOHNS advocate decolorizing with acetic alcohol and subsequent neutralization as giving a method in which the small rings stain, as they do not in Barber and Komp's technique.

C. L.

SINTON (J. A.). assisted by BANERJEA (A. C.). **Notes on the "Thick-Film" Method of Examination for Malarial Parasites.**—*Indian Jl. Med. Res.* 1925. Jan. Vol. 12. No. 3. pp. 537–544. [6 refs.]

When two persons for whom the thin film had been that of choice for many years plead for the extended use of the thick film their arguments must surely be respected by the most sceptical. The difficulties are frankly stated and the results compared. They are tabulated below and speak for themselves:—

		P. vivax.		*P. falciparum.*	
		Thin.	Thick.	Thin.	Thick.
Parasites in 100 fields:	proportion	1	4	1	16
Parasites found in 2 minutes:	,,	1	7·7	1	22
Time required to find first parasite:	,,	1	6·6	1	23

C. L.

GORDON (R. M.). **Changes in the Blood in Primary Malaria.**—*Ann. Trop. Med. & Parasit.* 1924. Dec. 30. Vol. 18. No. 4. pp. 595–599. With 3 charts. [3 refs.]

The number of erythrocytes, the percentage of these infected, and the colour index are studied in 3 cases of *P. vivax* infection deliberately induced in England for the treatment of general paralysis. In 2 cases (BEN-HAREL, this *Bulletin*, Vol. 21, p. 138; ROSS, p. 297) erythrocytes diminished before parasites were detected, and in one this fall continued after they ceased to be found. Parasites increased in number for 5 days after their first appearance in the cutaneous blood, and then, quite apart from quinine administration, lessened in numbers. Anaemia was of the simple type. In 2 cases the treatment consisted of 30 grains (2 gm.) on 2 consecutive days, and no parasites were found again on the 12 and 25 days following their immediate, or almost immediate, disappearance, these being the periods during which observation was continued.

C. L.

Horowitz-Wlassowa (L.). **Experimentelle Beiträge zur Frage der Malariaimmunität. (Spezifische Komplementablenkungsreaktion bei Malaria.)** [Specific Complement Deviation in Malaria. — *Zischr. f. Immunitätsf. u. Experim. Therap.* 1924. July 5. Vol. 40. No. 3. pp. 268–277.

A specific antibody is formed in those infected with malaria and is made evident by complement deviation, using as antigen malarial placenta. The quantity of antibody is variable; it is absent where there are many schizonts or gametocytes in the cutaneous blood, and persists in many cases for 5 years. About 10 per cent. of those who have never had malaria may show it.

C. L.

Antić (D.). **Experimentelle Arbeiten ueber die Immunität der Malaria.** [Experiments on Immunity in Malaria.] — *Cent. f. Bakt.* 1. Abt. Orig. 1925. Jan. 28. Vol. 94. No. 2. pp. 130–134.

Three rabbits injected intravenously or subcutaneously with half to 1 cc. of blood containing *P. vivax* or *P. falciparum* did not become infected. One man injected intramuscularly with a mixture of 2 cc. of rabbit's blood and an equal quantity of blood containing *P. vivax* became infected. A subtertian case twice injected intramuscularly with 3·5 cc. of rabbit's blood, and a tertian case similarly injected with 2 cc. were not cured. It is concluded that rabbit's blood is refractory, not because it contains parasiticidal substances, but because the parasites cannot force their way into a rabbit's erythrocytes.

C. L.

Montel (M. L. R.), Tran van An & Dang van Cuong. **Tension artérielle et viscosité sanguine dans le paludisme chez les Annamites de Cochinchine.** — *Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 799–811.

The arterial tension and blood viscosity of 68 Annamites, held to be suffering from malaria although parasites (benign tertian) were found in 2 only, are compared with the similar conditions in 41 controls held to be non-infected. It is concluded that the normal Annamite has a blood pressure lower than the European, the difference being accentuated when malaria occurs without acute attack. In this case viscosity is increased.

C. L.

Stefko (W. G.) & Botchkareff (P. V.). **Sur quelques propriétés morphologiques du sang dans le paludisme.** — *Bull. Soc. Path. Exot.* 1924. Oct. 8. Vol. 17. No. 8. pp. 631–637. [1 ref.]

Acute malaria has, it is held, five forms of leucocytic formula: (1) Before the attack a very marked mononucleosis with eosinophilia; (2) as the attack begins an ordinary leucocytosis, generally feeble; (3) in the hot stage a large-mononucleosis with little, or in grave cases no, eosinophilia; (4) in the sweating stage there appear leucocytes with deeply indented or duplicated nuclei. In chronic malaria leucopenia with lymphocytosis is held the rule. In the South West Crimea, where 50 to 100 per cent. of a sparse population (sparse because so many have died of starvation) is infected with *P. vivax*, mononucleosis is

"normal." In the absence of plasmodia diagnostic reliance is placed on pigmented leucocytes (62 to 70 per cent.) and Turk's cells 19·4 per cent.).

C. L.

WEEBER (Richard). **Beitrag zur Frage der Malariablutkonservierung.** [A Note on the Preservation of Malarial Blood.]—*Wien. Klin. Woch.* 1924. Dec. 25. Vol. 37. No. 52. pp. 1326–1328. [8 refs.]

Four leeches were fed on a case of malaria during an attack. After intervals of 42, 52 and 52 hours 1 cc. was removed by puncturing a leech with a syringe and was injected subcutaneously into three general paralytics. In one of the cases infection, microscopically established, occurred. The kind of malaria parasite seems nowhere to be mentioned.

C. L.

i. BARZILAI-VIVALDI (Gemma) & KAUDERS (Otto). **Unübertragbarkeit alter Impfmalariastämme durch Anophelen.** [Old Inoculation Strain of Malaria not conveyed by Anopheles.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1924. Nov. 10. Vol. 103. No. 4. pp. 744–763. [7 refs.]

ii. PLEHN (A.). **Beobachtungen bei Paralytikermalaria.** [Induced Malaria in Paralytics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 56–65. [1 ref.]

The questions raised are of marked biological interest.

i. Laboratory-bred *Anopheles maculipennis* were fed on 11 benign tertian malaria cases who had been injected with two of Wagner-Jauregg's strains which had undergone respectively 82 and 95 direct passages through man and were practically free from gametocytes. The mosquitoes which survived for 13 days inflicted 127 bites upon 6 malaria-free persons, none of whom developed malaria. The temperature at which the mosquitoes were kept seems nowhere to be stated. It is concluded that these "gametocyte-free" strains are harmless in any land.

ii. A Palestinian strain which persisted through 20 passages covering two years as a small parasite, segmenting when about half filling the erythrocyte and producing no gametocytes, suddenly, under conditions held to exclude contamination, took on all the ordinary tertian characters, including gametocyte formation.

C. L.

DAVIDSON (T. Wishart). **Treatment of General Paralysis by Malaria.**—*Brit. Med. Jl.* 1925. Mar. 7. pp. 452–453. [5 refs.]

Of 53 cases treated with an Indian strain of *P. vivax* the infection was conveyed by *Anopheles maculipennis* in 23 and by injection in 30. The shortest, average and longest incubation periods were for mosquito infection 7, 14, 20 days, for intravenous, 4, 7, 19, for intramuscular, 10, 16, 23. "Spontaneous cure" occurred in 34 per cent. of 23 cases, in which ten rigors were permitted. In 30 cases the treatment was terminated earlier by the administration of 30 grains of quinine daily for 3 days. Of the 23 mosquito infections 13 or 56·5 per cent. relapsed; of 30 inoculated cases only 1 or 3·3 per cent. The period of observation

was 21 days to 11 months. The relapses had the same treatment. In some cases 2, 3 or 4 further pyrexial attacks occurred. It is unfortunately not clear from the paper whether the spontaneous "cures" were at once treated with quinine, but it is evident from the figures that in many of them there must have been relapse.

C. L.

PLEHN. **Die Malariabehandlung der progressiven Paralyse. II. Mitteilung.** [The Malaria Treatment of General Paralysis.]—*Deut. Med. Woch.* 1924. Dec. 26. Vol. 50. No. 52. pp. 1827–1828.

The writer lost three of 17 cases treated by deliberate infection of subtertian malaria, although they were checked daily by thick drop examination. He advises, therefore, the examination of at least two smears daily, the percentage of infected corpuscles being in this way checked, and holds that this procedure gives safety; although he notes that the increase of parasites in the peripheral blood does not run parallel with the fever.

C. L.

BUNKER (Henry A.) & KIRBY (George H.). **Treatment of General Paralysis by Inoculation with Malaria. A First Report.**—*Jl. Amer. Med. Assoc.* 1925. Feb. 21. Vol. 84. No. 8. pp. 563–568. [20 refs.]

Two strains of benign tertian malaria were used with the following thermal effects:—

	Strain A.	Strain C.
Number of febrile attacks observed	125	340
Percentage of attacks in which the temperature reached at least:		
104° F.	58	91
105° F.	23	86
106° F.	3	64

Strain C had undergone 22 direct passages by intravenous injection, and appeared to be increasing in pyrogenetic virulence.

C. L.

SAAD (B.). **Les crises fulgurantes du tabès et le paludisme.**—*Ann. Dermat. et de Syph.* 1924. Oct. 6th Ser. Vol. 5. No. 10. pp. 597–599.

In a tabetic with *P. vivax* infection each febrile access produced acute lightning pains. These disappeared in the interval and were finally removed by treatment with quinine. Relapse followed, accompanied by the same pains. Both now yielded to cinchonidine.

C. L.

SEIDELIN (Harald). **The Preventive Use of Quinine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Oct. 23. Vol. 18. No. 4. pp. 203–206. [3 refs.]

The writer advocates the week-end prophylactic consumption of quinine, namely, 1 gm. of the hydrochloride on two consecutive days, or on 2 days with one quinine-free day between. The malarial attacks among those so treated have been few and mild, and the number of

working days lost only 0·3 per cent. The system adopted is the issue of a bottle of tablets containing sufficient for 3 months, with a blood examination before the issue of the next bottle. At these examinations 65 of 90 persons living continuously at Kinshasa, Belgian Congo, showed parasites in thick films. To those found infected a ten days' course of 1 gm. daily of the salt is given, and parasites have nearly always failed to be found at its end. Nevertheless, certain persons found with infections and yet not treated seem always to have experienced a spontaneous disappearance of parasites. It is held that the conditions correspond exactly to what might be expected in any infective disease if a specific treatment be started during the incubation period, a conclusion which seems to assume that these cases are new infections, and which does not explain the disappearance of parasites in those who had no special treatment.

C. L.

LEGENDRE (J.). **A propos de l'efficacité de la quinisation préventive dans la prophylaxie de la malaria.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 875–880. [18 refs.]; and 1925. Jan. 14. Vol. 18. No. 1. pp. 7–15. [Discussion.] [5 refs.]

A considerable body of evidence is marshalled from various sources, from which it is concluded that prophylactic quinine is ineffective, and that in doses of less than 0·9 gm. it masks infection without preventing or curing it. This point of view met with no apparent support from any other member of the Society.

C. L.

BERTRAND. **Administration de la quinine en capsules.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 175–176.

Prophylactic quinine should not be given in daily doses of less than 0·5 gm. No case of blackwater fever has ever been recorded where quinine dosage has been acknowledged as regular. These doses may, however, cause inconvenience, especially in women, a consideration which may justify their omission in healthier spots.

C. L.

VALCKE. **Quinine preventive.**—*Bull. Méd. du Katanga.* 1924. Oct. Vol. 1. No. 5. pp. 173–175.

"Capsules" containing quinine are, it is said, daily reported in the medical press as being passed unchanged in the stools.

C. L.

i. VAN STENIS (O.). **Acerca de dos casos de fiebre terciana maligna.** [On Two Cases of Subtertian Malaria.]—*Rev. Med. y Cirug.* 1924. May 31. Year 7. No. 74. pp. 152–154.

ii. STRICKLAND (C.). **Notes on Malaria in Hill-Stations in or near the Eastern Himalayas.**—*Indian Med. Gaz.* 1924. Nov. Vol. 59. No. 11. pp. 549–550. With 1 chart in text. [3 refs.]

iii. MASSON (Clement B.). **The Effect of Malaria on the Nervous System with Special Reference to the Malarial Psychoses.**—*Amer. Jl. Med. Sciences.* 1924. Sept. Vol. 168. No. 3. (No. 630.) pp. 334–371. [53 refs.]

iv. LE DANTEC (A.). **Accès fluxionnaires intermittents palustres.**—*Bull. Soc. Path. Exot.* 1924. Nov. 12. Vol. 17. No. 9. pp. 773–778.

v. Corrigan (S. Harvey) & Corrigan (Cecil Edwin). **A Case of Tertian Malarial Fever following an Operation for Appendicitis.**—*Canadian Med. Assoc. Jl.* 1924. Dec. Vol. 14. No. 12. pp. 1204–1205.

vi. Farreras (P.). **Acerca del paludismo.**—*Rev. Española de Med. Cirug.* Barcelona. 1924. Dec. Vol. 7. No. 78. pp. 730–740.

vii. van den Bergh (D.). **Das Anfangsfieber bei primärer autochthoner Tertianamalaria.**—*Klin. Woch.* 1925. Jan. 8. Vol. 4. No. 2. p. 73. With 1 chart in text.

viii. Floros (A.). **Liquorbefund bei Malaria perniciosa.**—*Ibid.* Jan. 29. No. 5. p. 214.

i. Asthmatic symptoms, accompanied in one case by urticaria, came and went *pari passu* with the fever in these Venezuelan sisters, and disappeared finally under quinine. Such symptoms were not encountered with other species of malaria parasites.

ii. A symposium of the work of McCombie Young and Shortt (this *Bulletin*, Vol. 21, p. 595) in Shillong, and of his own (*tom. cit.*, p. 607) in Kurseong. The incidence of malaria in Shillong is inversely as the rainfall of the previous year. Contour drains are advocated for this station.

iii. Four depressive states in malarious subjects cleared up under quinine.

iv. Intermittent swelling and urticaria occurred in one in whom no evidence was found of Loa or of Plasmodium.

v. A woman left Temesvar, Roumania, in February and developed appendicitis with benign tertian malaria in Southern Saskatchewan, Canada, in July of the same year. The possible date and mode of infection are discussed.

vi. This résumé of malaria literature contains a reference (*Riv. de Biol.* 1923, fasc 1) in which, it is stated, Grassi claims to have been the first to surprise a microgamete of subtertian malaria impregnating a macrogamete of tertian malaria.

vii. It is deemed noteworthy that the primary fever of simple tertian malaria may be continuous.

viii. In a youth of 20 with crescents found in a thick film, strongly positive Wassermann, Sachs-Georgi and Hecht reactions, and no history of syphilis, congenital or acquired, all the signs cleared up under quinine without arsenic.

C. L.

i. Grassi (Battista). **Twenty-Five Years After. A Chronicle of the Discoveries relating to the Mode of Transmission of Human Malaria.**—*Parasitology.* 1924. Dec. Vol. 16. No. 4. pp. 355–364.

ii. —. **Nach fünfundzwanzig Jahren. Chronologische Uebersicht der Entdeckung der menschlichen Malariaübertragung.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Aug. 22. Vol. 92. No. 5-6. pp. 392–397. [3 refs.]

iii. Dumitresco-Mante. **Sur un cas d'urticaire palustre. Crise hémoclasique précédant l'accès fébrile urticarien.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1925. Feb. 12. Year 41. 3rd Ser. Vol. 49. No. 5. pp. 200–202. [10 refs.]

iv. Monteleone (Remo). **Frequenza del polso come equivalente di accesso malarico.**—*Policlinico.* Sez. Prat. 1925. Mar. 2. Vol. 32. No. 9. pp. 305–308. With 1 chart. [9 refs.]

v. Gabriel (C.). **Accès a-parasitaires provoqués chez les paludéens traités par l'eau minérale d'Encausse (Haute-Garonne).**—*C.R. Soc. Biol.* 1924. Dec. 12. Vol. 91. No. 35. pp. 1255–1256.

vi. Mackenzie (Ian). **Notas preliminares sobre una investigación de patologia y tratamiento del paludismo.**—*Gac. Méd. de Caracas.* 1924. Aug. 15. Vol. 31. No. 15. pp. 227–229.

vii. Kluge (Otto). **Behandlungsschema für chininfeste Malaria.**—*Deut. Med. Woch.* 1925. Jan. 30. Vol. 51. No. 5. p. 193.

viii. Caussade (G.) & Tardieu (André). **De quelques indications de la méthode de Bretonneau-Trousseau : traitement de certaines formes de paludisme.**—*Presse Méd.* 1924. Dec. 13. Vol. 32. No. 100. pp. 989–990. [8 refs.]

ix. Schilling (Viktor), Jossmann, Hoffmann (Karl), Rubitschung & van der Spek. **Biologisch-klinische Blutstudien über allgemeine Infektionsfragen an der Impfmalaria der Paralytiker, besonders über ihre unspezifische Wirksamkeit.** [Biological and Clinical Blood Studies in Induced Malaria in Paralytics.]—*Zeitschr. f. Klin. Med.* 1924. Oct. 25. Vol. 100. No. 6. pp. 742–776. [58 refs.]

i & ii. The reopening of this controversy seems to call for no alteration in the position already defined in this *Bulletin* (Vol. 20, p. 613 ; Vol. 21, p. 616).

iii. In an infection with *P. vivax* each access was accompanied by urticaria ; parasites, fever and urticaria disappearing together under quinine.

iv. In a mixed infection with *P. vivax* and *P. falciparum* after fever had spontaneously disappeared, isolated irregular attacks of tachycardia were correlated with parasitic evolution [presumably with sporing].

v. "Malarial" cases treated with baths at Encausse, Haute-Garonne, usually have a sharp rise in temperature to about 40° C. soon after beginning treatment. No plasmodia have ever been found in these attacks.

vi. The basis of certain work carried out in East Africa is indicated. It is noted how the Schaudinn theory of "parthenogenesis" demonstrates the easy passage from pure speculation, through probable hypothesis, to certain observation ; and all without a particle of added proof.

vii. A varied attack with intravenous salvarsan, methylene blue capsules, and intramuscular quinine each repeated on its own due day is advised to overcome quinine resistance. The writer's conception of this condition is not indicated.

viii. Daily administration of 8 to 10 gm. of powdered bark of *Cinchona calisaya* was followed by improvement in 2 cases in which malaria parasites were not found in the blood and in which quinine had failed.

ix. The action of malaria on general paralysis is held to be non-specific.

C. L.

Akiyoshi (T.). **Ueber Malariabehandlung der Syphilis.**—*Japan. Jl. Dermat. & Urol.* 1924. Sept. Vol. 24. No. 9. pp. 63–69.

Balfour (Andrew). **Historical Aspects of Malaria.**—Royal Institution of Great Britain. Weekly Evening Meeting, Friday, May 23, 1924. 13 pp.

van Bodegom (J. L.). **Malaria en tegelijk paratyphus B.**—*Nederl. Tijdschr. v. Geneesk.* 1924. Dec. 27. Vol. 68. 2nd Half. No. 26. pp. 3251–3252. With 1 chart in text.

Charrier (H.). **Le Paludisme dans la région de Tanger (Maroc).**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 355–360. With 1 fig.

Donner (S.). [**Malarial Treatment of Progressive Paralysis.**]—*Finska Lakaresallskapets Handlingar.* 1925. Jan. p. 8. [Summarized in *Brit. Med. Jl.* (Epitome of Current Med. Literature.) 1925. Mar. 14. p. 49.]

FREIFELD (E. I.). **Microscopical Changes in Brain in Malaria Cases.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 1. In Russian pp. 1–8. With 4 figs. With English summary.

GERSTMANN (Josef). **Ueber die Malariaimpfbehandlung der progressiven Paralyse.**—*Seuchenbekämpfung.* Vienna. 1924. Vol. 1. No. 1-2. pp. 2–10.

HERRMANN (G.). **Ueber die Malariabehandlung der juvenilen Paralyse.**—*Med. Klin.* 1924. June 1. Vol. 20. No. 22. pp. 745–746. With 1 fig. [1 ref.]

HUYSSEN (Carlos W.) & BUENDIA (Rogelio). **Errores de diagnóstico en las formas atipicas del paludismo.**—*Siglo Med.* 1924. Dec. 13. Year 71. Vol. 74. No. 3705. pp. 577–578.

KUSCHEW (N. E.). **Die Geschichte der Malaria.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 1. In Russian pp. 9–14. With German summary.

LEWIS (Nolan D. C.), HUBBARD (Lois D.) & DYAR (Edna G.). **The Malarial Treatment of Paretic Neurosyphilis.**—*Amer. Jl. Psychiatry.* Baltimore. 1924. Oct. Vol. 4. No. 2. pp. 175–221. With 22 figs. & 5 charts in text. [67 refs.]

LUKOWA (A. I.). **Veränderungen der Venen bei intravenösen Chinineinspritzungen.**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 3. In Russian pp. 16–20. With German summary.

MACBRIDE (Henry J.) & TEMPLETON (W. L.). **The Treatment of General Paralysis of the Insane by Malaria.**—*Jl. Neurol. & Psychopathology.* 1924. May. Vol. 5. No. 17. pp. 13–27. [15 refs.]

MCGRATH (W. M.). **Malarial Therapy in General Paralysis of the Insane. The Disappearance of Gastric Crises as one of the Results.**—*Lancet.* 1924. Nov. 8. pp. 960–961.

MANDRU (V.). **Contribution à la prophylaxie du paludisme.**—*Paris Méd.* 1924. Feb. 23. Vol. 14. No. 8. pp. 181–182.

MAXCY (K. F.). **Mortality from Malaria, 1919-1923.**—*Public Health Rep.* 1924. Oct. 10. Vol. 39. No. 41. pp. 2559–2561. [1 ref.]

MOLL (J. Marius). **Malaria Treatment of Progressive Paresis (G.P.I.).**—*S. African Med. Rec.* 1924. June 28. Vol. 22. No. 12. pp. 288–289.

SALAZAR (Martin). **Tratamiento de la paralisis general por la inoculación artificial del paludismo.**—*Siglo Med.* 1924. June 7. Year 71. Vol. 73. No. 3678. pp. 561–562.

SALKIND (E.). [**Erkrankungen des Nervensystems und Geistesstörungen bei Malariakranken in Dagestan.**]—*Jugo-wostotchni Westnik Sdrawochranenia.* 1923. No. 12. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Mar. 1. Vol. 29. No. 3. pp. 143–144.]

SEGUIN (T.). **A propos du traitement du paludisme.**—*Bull. Soc. Path. Exot.* 1924. Dec. 10. Vol. 17. No. 10. pp. 874–875. [1 rèf.]

VALENTI (Adriano). **China-alcaloidi della china e malaria.**—*Policlinico.* Sez. Prat. 1925. Mar. 9. Vol. 32. No. 10. pp. 341–344.

WALRAVENS (P.). **Index paludique et quininisation des réservoirs de virus.**—*Bull. Méd. du Katanga.* 1924. Aug. Vol. 1. No. 4. pp. 123–127.

BLACKWATER FEVER.

THOMSON (John Gordon). **Researches on Blackwater Fever in Southern Rhodesia.**—*London School of Tropical Medicine. Research Memoir Series.* 1924. Vol. 6. pp. vii+149. With 12 charts, 10 plates & 1 map.

Dr. A. M. FLEMING visited the London School of Tropical Medicine and made arrangements whereby the administration of Southern Rhodesia should employ the services of medical men in research in tropical diseases. The Government of Rhodesia undertook to supply the funds for this work, and, it having been decided that blackwater fever was the subject of greatest importance to the territory, the author visited Rhodesia in 1922 and 1923 for the purpose of investigating this disease.

The report gives an admirable account of the present state of knowledge regarding blackwater fever, and although it perhaps does not throw much new light on the subject, will nevertheless prove of greatest value to those who have to deal with this dread disease, and will form an excellent basis for future investigation. If it has any defect, it is that it is not always quite easy to be certain whether the author is referring to his own observations or quoting from those of previous workers.

The matter dealt with in certain portions of this report, notably that referring to the relationship between blackwater fever and malignant tertian malaria, and that dealing with the question of pseudo-spirochaetes in the blood of blackwater fever patients, has already been published elsewhere and has been noticed in this *Bulletin* (see Vol. 21, p. 64, p. 385, and p. 804).

The second chapter is devoted to an account of the geography of Southern Rhodesia, the hydrographic and meteorological conditions met with, and the distribution of the disease in that country and throughout the world. In the next chapter a brief historical account of the disease is given and of the history of quinine in malaria and blackwater. Chapter 4 is concerned with the important question of the correlation of malaria and blackwater fever, and the following chapter with the malarial parasites found in blackwater fever. In Chapter 7 the question of haemolysis in general and especially in blackwater fever is discussed at length. A summary of previous work is given, and the author states that he was able to confirm the observation of earlier investigators that in blackwater there is no detectable autolysin comparable to that which is so readily demonstrable in paroxysmal haemoglobinuria. He notes, however, that successful cultures were obtained of the asexual cycle of 18 cases of *P. falciparum*, and on 5 occasions in which no development took place haemolysis was observed; there was no bacterial contamination, and it was found that if the blood was drawn at a period corresponding to schizogony in the body haemolysis invariably took place in the tubes. It is suggested that by cultural methods and the use of careful technique and controls it may be possible to demonstrate haemolysis at certain stages of the asexual cycle, *e.g.*, during schizogony.

In the next chapter the changes in the blood and the pathological lesions in the tissues are described. The organs most affected are the kidneys, liver, heart and spleen. Nearly the whole of the specialized epithelium of the kidney is destroyed, and the liver is also severely

damaged, so that one could expect to find a slight degree of haemo-hepatogenous jaundice. Malaria pigment when present was noted most in the endothelial cells of the spleen pulp, and it also occurred in the endothelium of the glomeruli and hepatic capillaries.

Chapters 8 and 9 are concerned with the—from the pathological point of view—very important questions of haemoglobinaemia and jaundice. They give a summary of previous work, but, unfortunately, things are left in their previous unsatisfactory state. The author briefly records that his observations show that haemoglobinaemia precedes haemoglobinuria, and that in cases where it cannot be detected it has been missed owing to its rapid elimination from the serum. Probably this is correct, but it undoubtedly requires proof; one of the most striking problems about blackwater fever is the relatively small degree of haemoglobinaemia which is found, as compared with that in such diseases as paroxysmal haemoglobinuria and those due to piroplasma infections. A true jaundice developed in a large number of the Rhodesian cases within the first 12 to 15 hours and varied greatly in intensity. In three cases it was intense a few hours after onset, and was as severe as an acute obstructive jaundice. All cases of severe jaundice seen by the author were fatal: the gall bladder in the five fatal cases was distended with thick bile and the colour of the liver in section varied from yellow to dark bronze.

The following chapter is devoted to the urine, but here again the author contents himself with little else than a summary of previous work. Chapters 11 and 12 deal respectively with symptomatology and treatment and prophylaxis, and the next chapter consists of a number of conclusions, which are as follows:—

"(1) From an examination of the literature on blackwater and my own observations in Rhodesia I have come to the conclusion that the disease is due to repeated attacks of *P. falciparum*.

"(2) Observations on the haemolytic problem show that the condition strongly resembles the phenomena produced by the action of a specific serum haemolysin, and the altered chemical composition of the red cells as seen in infections with *P. falciparum* in Rhodesia suggest the mode by which a specific autolytic substance is produced. This haemolytic amboceptor would tend to act only on cells so altered.

"(3) From the above conclusions it is suggested that further research be instigated with a view to finding a specific anti-haemolytic serum, which could be administered to patients in whom the haemolytic mechanism was suspected.

"(4) The prevention of malaria will eradicate blackwater fever.

"(5) There is no evidence that any other specific organism is the causal factor of this condition, but these may act as exciting factors of the actual onset.

"(6) Quinine, as I have indicated, is the most valuable drug in its prevention, but unfortunately it is seldom used properly, and so has fallen into disrepute.

"(7) Treatment is symptomatic.

"(8) Finally, as we know the hygienic measures necessary for the prevention of malaria, there is no reason why blackwater should not be stamped out of those areas where it is endemic."

The volume, which closes with a very complete Bibliography, is beautifully printed and illustrated, and as stated above, cannot fail to be of great value to all who are called upon to deal with blackwater fever. The disease is one of wide distribution, and greatly dreaded on account of the severity of its symptoms, its prolonged convalescence, and its relatively high mortality. As Thomson has shown, the literature relating to the subject, which goes back to the middle of the

last century, is of a most voluminous character, and yet present knowledge of many aspects of the subject is most unsatisfactory. It is to be hoped that this excellent statement of the present position of things will call forth further efforts to elucidate the pathological processes occurring in one of the most important of exotic diseases.]

W. Yorke.

NOCHT (B.) & KESSLER (A.). **Zur Frage des Schwarzwasserfiebers.** [On the Question of Blackwater Fever.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Oct. Vol. 28. No. 10. pp. 443–453. [5 refs.]

The authors endeavoured to ascertain whether the watery extract of spleen, liver and kidneys removed aseptically from a case of blackwater fever immediately after death, added to various amounts of quinine either with or without carbonic acid, had any effect on human red cells, and whether any difference was to be observed in this respect between the organs from the case of blackwater fever and those from other corpses.

RUSNIAK* has shown that by the addition of a small quantity of quinine the carbonic acid haemolysis is expedited, and that the protective action of serum or of hypertonic saline in carbonic acid haemolysis is annulled. RUSNIAK considers that possibly a local circulatory disturbance in the internal organs, with a resulting increase of carbonic acid, causes, in the presence of quinine in sufficient concentration, haemolysis and an attack of blackwater.

The authors' experiments were conducted first at room temperature, and then at 37° C. The quinine solution used consisted of 2·5 gm. of quinine hydrochloride in 300 cc. of physiological saline and in a table the concentration of quinine obtained by adding 1 drop, 2 drops, 3 drops, etc., of this solution to 1 cc. of serum is shown. The red cells for investigation were obtained by means of centrifuging and washing 5 times in normal saline; the organ extracts were made by grinding up pieces of the freshly removed organs in clean sterile sand with twice the volume of sterile saline, the material then being passed through a coarse sterile filter.

Two series of experiments were performed, the one with CO_2 and the second without it. In the CO_2 series the serum was first saturated with the gas and then the mixture made and the tubes placed in a desiccator and allowed to stand in an atmosphere of CO_2 for a quarter of an hour. The various constituents were added to the tube as follows: (1) Serum; (2) extract; (3) red cells; (4) quinine solution. As but little haemolysis occurred at laboratory temperatures all later experiments were conducted at 37° C. The results are given in a series of tables.

The following are the conclusions:—

1. At room temperature slight haemolysis after more than 6 hours was noted with a concentration of quinine of 1 : 485 in the presence of CO_2. Blackwater fever extracts inhibited this feeble haemolysis.

2. In CO_2-free conditions no haemolysis was noted at 37° C. after 6 hours; on the following day haemolysis was noted in extract-free tubes with quinine concentration of 1 : 1,229, and in tubes containing liver extract and kidney extract with quinine concentration of 1 : 787.

* Chinin und Blut. *Biochemische Zeitschr.* 1920. Vol. 104, p. 13, and Vol. 105, p. 117.

3. The blackwater fever spleen extract is exceptional. It exhibits, as compared with the other organs and also with the organs of healthy individuals, a striking behaviour in that it inhibits haemolysis with the higher quinine concentration. A definite distinction was not observed whether CO_2 was present or absent.
4. Carbonic acid does not assist quinine haemolysis.
5. Serum exerts a strongly inhibiting action to the haemolysis.
6. Especially striking is the inhibiting effect of icteric serum.
7. The most easily lysed erythrocytes were those from a patient suffering from *P. falciparum*, whilst those from a case of tertian malaria exhibited no peculiarity.
8. The anti-haemolysing action of small amounts of quinine noted by SCHNABEL was also observed in these experiments.

W. Y.

SCHILLING (Viktor) & JOSSMANN. **Ein Fall von Schwarzwasserfieber nach Impftertiana bei Paralyse.** [A Case of Blackwater Fever after Inoculation of Tertian Malaria in General Paralysis.]—*Klin. Woch.* 1924. Aug. 12. Vol. 3. No. 33. pp. 1498–1499. With 1 fig. [3 refs.]

Details are given of a case of general paralysis which developed blackwater fever after inoculation with simple tertian malaria. The patient is 25 years of age and contracted syphilis in 1912. Since 1918 he has exhibited symptoms of general paralysis, and the Wassermann reaction was strongly positive on 22nd February, 1924. On 13th March, 1924, he was inoculated intravenously with simple tertian blood from another case of general paralysis. The strain was originally obtained from a naturally infected case in the Balkans and has been used for about 100 general paralytics; it was a pure infection of *P. vivax* and had never given rise to any particularly virulent infection. The incubation was short, and the patient was allowed to have 16 rises of temperature as he stood the attacks well; he was then given on 2nd April two teaspoonsful of *Neopanchinal* daily (a total extract of cinchona bark prepared by Schmitz of Breslau; the dose contains about ·25 gm. of pure quinine). The temperature fell to normal the following day and parasites had disappeared from the blood. The drug was continued twice daily until 5th April, after which it was given once daily until 9th April, when, owing to signs of heart weakness, caffeine, digitalis and camphor were given. On 10th April, as it was considered that possibly the malaria was not cured, quinine hydrochloride was given in doses of ·5 gm. twice daily. Blackwater fever set in the same afternoon. The attack was mild and the patient recovered.

W. Y.

REZNIK (J.). **Hémoglobinurie et sérum antivenimeux.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Nov. Vol. 4. No. 2. pp. 179–180.

Details are given regarding the treatment of blackwater fever in two young Portuguese by intravenous injections of antivenomous serum. The first case was given 10 cc. of the serum and 1½ hours later the urine was perfectly clear and the patient recovered; the second case was also given 10 cc. of the serum and the urine half an hour later was perfectly clear; he had a slight relapse the next day and was given another 10 cc. of the serum and an hour later the urine was clear.

The author writes that it is very difficult to draw definite conclusions from two observations; he can only state that the treatment was very favourable. [It is, of course, impossible to state that the injections had no effect on the course of events, but it is abundantly clear that the author has not the slightest ground for claiming anything from the facts as presented in his paper.]

W. Y.

DE ROOK (H.). **Nadere beschouwingen over Zwartwaterkoorts. (Uit de geneeskundige verslagen der wetenschappelijke Central-Guinea-expeditie 1920-1922.)** [Some more Remarks on Blackwater Fever. (From the Medical Reports of the Scientific Central New Guinea Expedition, 1920-1921.)]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 4. pp. 632–641.

De Rook saw 40 cases of blackwater fever during the expedition, three ending fatally; the shortest term between arrival in the malaria district and the outbreak was four months. The author ascribes this to the great density of malarial infection and to unavoidable difficulties in the administration of quinine. All the patients had suffered from malaria and were insufficiently treated; in 8 cases occurring in patients still in hospital the presence of Plasmodia in the blood was demonstrated. De Rook advises not to give quinine during the attack unless the fever is very persistent. In such cases it should be administered refracta dosi.

W. J. Bais.

THOMSON (J. G.). **Preliminary Report on the Results of Investigations into the Causation of Blackwater Fever in Southern Rhodesia. Presented to the Legislative Council, 1923.**—*Jl. Roy. Army Med. Corps.* 1924. Nov. Vol. 43. No. 5. pp. 376–377.

JACKSON (O. E.). **"Blackwater Fever."**—*S. African Med. Rec.* 1924. June 28 Vol. 22. No. 12. pp. 273–286. [10 refs.]

REVIEWS AND NOTICES.

HAUGHWOUT (Frank G.) [Protozoologist, Bureau of Science, Manila, P.I.]. **The Practical Microscopic Diagnosis of Dysentery.**—*Bulletins from the Inst. for Med. Res., Federated Malay States.* 1924. No. 3. 130 pp. With frontispiece, 20 plates and 7 text figs.

Clinicians and pathologists, especially in those areas where dysentery is endemic and epidemic, will find this monograph of the greatest practical use in assisting them to arrive at a diagnosis, both in the case of the true dysenteries and also in conditions which may simulate them. The cytological pictures of the various intestinal conditions are dealt with in detail, and the author has employed as amplification of his descriptions numerous text figures and photo-micrographs. The microscopic appearance of bacillary, amoebic and balantidial dysenteries are discussed, and are compared with the exudates due to other intestinal inflammatory causes.

The basis of this publication is the original observations of WILLMORE and SHEARMAN (1918), who pointed out that in acute bacillary dysentery the cell picture under the microscope was characteristic, and of great value in the rapid diagnosis of cases urgently requiring treatment. During the Great War, especially in the Near East, it was the custom in many laboratories to report the cytological findings at once to the clinicians, who, correlating this with the clinical aspect of the case, were able to start the necessary treatment, thus avoiding the vexatious delay in waiting for a bacteriological report regarding the type of organism isolated from the faeces.

Sections of the book are devoted to the technique of faecal examinations, to the pathology of the dysenteries and the association of the pathology with the cellular exudate in the faeces, and to a well illustrated analysis of the various important cells. For ready reference the author has summarized in a table at the end of the book the chief points which have been dealt with, but he emphasizes the importance of using this only after a careful study of the publication as a whole, and even then it should be used in association with the appropriate sections of the text.

The most important features in the differentiation of cell exudates in various intestinal infections may be briefly stated as follows: (1) In acute bacillary dysentery the cellular exudate is characteristic of that condition and of no other intestinal disorder. Phagocytic endothelial macrophages are considered as pathognomonic, while polymorphonuclear cells with fatty inclusions and annular degeneration of the nuclei predominate, forming about 90 per cent. of the cells present. Marked toxic necrosis is seen in many cells. (2) In intestinal exudates due to bacterial inflammatory conditions other than the true bacillary dysenteric group, *e.g.*, abscess formation, septic processes of the gut due to broken down haemorrhoids, fistula, etc., or resulting from the effects of such irritant poisons as mercury or arsenic, endothelial macrophages and ghost cells are rare or absent. Polymorphonuclears (pus cells) predominate, but usually the cytoplasm is intact. (3) Ghost cells and endothelial macrophages are absent in acute amoebic dysentery and balantidiasis. Polymorphonuclear leucocytes are variable in number, but do not form a dominant feature of the picture. The diagnosis of these two diseases ought to be made by finding *Entamoeba histolytica* and *Balantidium coli* respectively, and the proportion of polymorphonuclears present can be used as a rough index of the extent of accompanying bacterial invasion.

J. G. Thomson.

Revista Médica de Angola. **Número especial consagrado ao Primeiro Congresso de Medicina Tropical da Africá Ocidental.** No. 4. [Vols. 1–5.]—Agosto de 1923. [Lisbon: Repartição de Saude do Ministério das Colónias.]

This Report of the Congress of Tropical Medicine held at Loanda in 1923 occupies five volumes, and an aggregate of over 2,000 pages. The Congress, which appears to have been well organized, was attended by delegates from Angola, Belgian Congo, France and the French possessions in Equatorial and West Africa, Great Britain, Mozambique, Nigeria, Portugal and Portuguese India, St. Thomé, and the Union of South Africa; it included altogether 76 participants, and held ten sessions. The subjects discussed were very comprehensive in their range and included all the classical "tropical" diseases, besides eye diseases, rabies, smallpox and vaccination, surgery of elephantiasis, syphilis and venereal prophylaxis, tuberculosis, and a number of miscellaneous subjects, such as intestinal parasites, skin parasites, drugs and indigenous poisons, climate, meteorology, anthropology and ethnology. Public Health and Sanitation received a large share of attention and were discussed under the headings of hospitals and hospital administration, maternity and infant welfare, preventive measures, sanitary organization, sanatoria general and special, and social hygiene. The papers and discussions are published in extenso, and the more important of them have been or are yet to be individually noticed in the *Bulletin*.

A. Alcock.

Proceedings of the International Conference on Health Problems in Tropical America held at Kingston, Jamaica, B.W.I., July 22 to August 1, 1924 by invitation of the Medical Department United Fruit Company.—pp. xxi + 1010. With 16 plates (5 in colour), various figs and charts. 1924. Published by United Fruit Company, Boston, Massachusetts.

This volume records the proceedings of the Conference on Health Problems in Tropical America held at Kingston, in Jamaica, by invitation of the Medical Department of the United Fruit Company—a conference sustained by 62 participants, including some of the leaders of medical research, some of the most distinguished exponents of modern sanitary doctrines, and representatives of numerous institutions, services, and official departments in America and Europe. In his opening address Dr. Deeks, the General Manager of the Medical Department, in stating that the object of the Conference was to get guidance, compared the inhibited development of tropical countries caused by the prevalence of tropical diseases in their ports to the effects exercised by a naval blockade upon a belligerent. He also referred to the increasing cultivated acreage in tracts recently uninhabited that has followed the application of modern knowledge of tropical diseases, and expressed his conviction that the current of immigration will set towards the tropics when those diseases have been brought fully under control. Seventy papers discussed at the Conference are published in this Report, and are already in course of notice in the appropriate sections of this *Bulletin*.

It is long since Napoleon taught that an unhealthy military site is worse than the bloodiest battle, and the United Fruit Company has been one of the first chieftains of industry to realize, conversely, the economic value to a site of an efficient medical department. It is hardly an exaggeration to say that this handsome achievement by a mercantile corporation of a conference to discuss the principles of preventive medicine in tropical countries inaugurates a new era—none the less truly humane for not being avowedly humanitarian.

A. Alcock.

CAWSTON (F. Gordon.). **"Bilharzia," a Paper for the Practitioner.** [Reprinted from the *Jl. Trop. Med. & Hyg.*]—20 pp. 1925. London: John Bale, Sons & Danielson, Ltd., 83-91, Great Titchfield Street, W. [Price 2s. 6d. net.]

This booklet deals with the chronic haematuria of schistosome origin that occurs, particularly among children of school age, in certain parts of South Africa, especially along the Natal coast. The ova, as found in the urine, the intermediate molluscan host, and the cercaria are briefly characterized; the signs and symptoms of the human infection are depicted; and the treatment by intravenous injection of tartar emetic and the precautions to be adopted and the management of attendant risks are very fully described.

A. Alcock.

CALMETTE (A.) [S.-Directeur de l'Institut Pasteur], NÈGRE (L.) & BOQUET (A.) [Chefs de Laboratoire à l'Institut Pasteur]. **Manuel technique de microbiologie et sérologie.**—568 pp. With 14 figs & 3 plates in colour. 1925. Paris: Masson et Cie., 120 Boulevard Saint-Germain. [Price 35 fr.]

The Institut Pasteur of Paris is the Mecca of bacteriology, and all bacteriologists will give a cordial reception to a technical manual which embraces the manifold experience accumulated since the science had its birth. This volume appears under the distinguished names of Calmette, Nègre, and Boquet. It is, as is emphasized in the preface, not a treatise nor a course on microbiology. It is not addressed to "débutants" but only to those who already have some experience in laboratory manipulations. It is intended to lie on the table of the research worker, so that he may have at his hand a friend and a guide whom he may consult during the course of his daily work. The whole technique of microbiology and serology is covered in its various chapters, and this, with a fullness of detail and a clarity of exposition for which the French school is justifiably famous. It is impossible in a review to deal with the subject matter of a book of this sort in detail; it is only possible to draw attention to certain points which interest the reviewer. In the majority of manuals the usual tendency is for the author to confine himself to such organisms as are cognate to his own province, be it medicine or agriculture. In this volume a table of the principal biological characteristics—motility, sugar reactions, etc.—of many hundreds of the more common bacteria is included. This will be of great service, as it describes, for example, such features as the type of animal for which the bacterium in question is pathogenic. In addition to this, separate tables for differentiating particular groups of pathogenic organisms are included. The chapters devoted to serology are very complete, and the technique of each reaction is given in detail. A further chapter is devoted to the determination of the activity of the principal diastases. The subject matter is thoroughly up to date. The volume should be in the hands of all laboratory workers.

A. G. McKendrick.

BOTREAU-ROUSSEL. [Médecin-Major de 1re Classe des Troupes Coloniales.] **Ostéites pianiques "Goundou."**—pp. iv.+132. With 89 figs. 1925. (Collection de la Société de Pathologie Exotique.) Paris: Masson et Cie., 120 Boulevard Saint-Germain. [Price 16 fr.]

There are more fish in the sea than ever came out of it! The monograph under review is an excellent example of this saying as applied to tropical medicine. The author, during four years spent on the Ivory Coast, saw

only one case of goundou; then, in August, 1916, two other cases presented themselves for treatment within a few days of each other. Removal of the tumours was done in each case. The success of this treatment was soon rumoured far and wide, and other cases started coming in to submit to surgical intervention, with the result that during the last twelve months Dr. Botreau-Roussel was there he saw 130 cases of goundou, and operated on 113! These cases and subsequent pathological work on the material obtained form the subject matter of this monograph, which is without doubt perhaps the most important contribution to the subject of goundou, and incidentally one of the most important contributions to yaws.

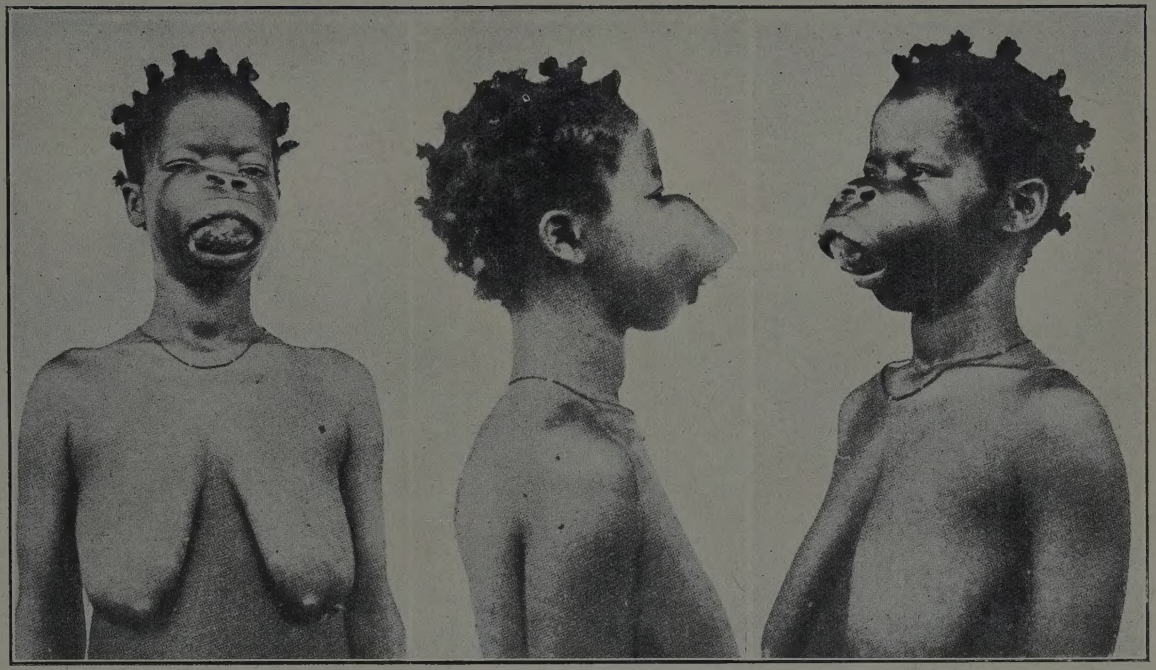
The first chapter recapitulates what was already known about this affection and its geographical distribution, and reference is made to the ancient Inca skull from Peru described by LETULLE, which shows the characteristic lesions of goundou. Mention is also made of the goundou-like affection reported in monkeys. The bony lesions under consideration—goundou and osteitis elsewhere—were often associated and appear definitely connected with yaws. Goundou was observed in an early stage during the eruptive stage of yaws in one case; in a later stage of evolution some years after the secondary yaws eruption, 79 cases; in an arrested stage late after yaws, 49 cases—giving a total of 130 cases. The history of each case was taken with care and the following facts were elicited: The lesion appeared during the eruptive stage of yaws in 64 cases; shortly afterwards in 34 cases; long afterwards in 5 cases; no history obtained, 25 cases; yaws denied but attempts to inoculate with yaws failed, 2 cases. Again, 48 showed paranasal tumours only; 65 showed lesions of other bones; in 10 paranasal tumours were absent or secondary to bony tumours of some other part of the face; in 7 others there was osteitis of long bones of limbs without affection of bones of the face.

The localization of bony lesions was as follows:—

Paranasal, unilateral,	13	121	Tibia		69
bilateral ...	108		Fibula		5
Superior maxilla (not above included)		23	Femur		4
			Ulnar and radius		5
Mandible		16	Clavicle		3
Malar		1	Humerus...		2
Cranium		2	Phalanges		1

It must be remembered in regard to this table that the majority of patients came under observation for the specific purpose of having the paranasal tumours removed, and therefore it does not give probably a correct idea of the relative frequency with which the various bones are affected.

There follow accounts of a number of examples of the condition with a wonderful and unique series of photographs. Among these is one of an infant aged 18 months which was brought by its mother on account of a yaws eruption and for pain which the child appeared to suffer day and night. Two weeks later a swelling on each side of the nose was observed, which four weeks later presented the typical characters of goundou. Swellings also showed on the anterior surfaces of each tibia and at the lower ends of the radii. A 10 cgm. dose of N.A.B. was then administered, and repeated three times at 10-day intervals, by which time all signs and symptoms had disappeared. In a second case, a boy aged 8 years, a widespread osteitis developed at the moment when the yaws rash disappeared, and when seen a year later the radius, ulnar, phalanges, humerus, femur, tibia and fibula on each side and the lower jaw were affected. After 4 injections of N.A.B. improvement set in and all pain disappeared, and though the swellings had diminished in size they had not entirely disappeared. A third case resembles the second plus paranasal tumours, these signs developing in a boy, now about 16 years old, when he was suffering from yaws at 2½ years of age.



Bossoma Abra: An extreme case of goundou in which the superior maxilla is entirely involved and forms an enormous mass protruding from the mouth.

[Reproduced from Botreau-Roussel: Ostéites pianiques "Goundou." (Masson et Cie.).]

In the cases described under the heading of osteitis of long bones without face lesions we recognize the lesions usually ascribed to yaws by other writers. In only a single case was any condition resembling dactylitis seen. It is interesting to note that among these and many other cases a general adenopathy was noticed, the epitrochlear glands being particularly mentioned (a sign almost diagnostic of syphilis in this country). Another group of cases deserving of mention are those presenting face lesions which are not typical of the classical description of goundou—a horse-shoe form encircling the bridge of the nose, small tumours on the superior process of the maxilla and external part of the malar bone on each side, tumour the size of a man's fist involving the body of the maxilla on each side, a tumour of the mandible, the two latter accompanied by typical goundou tumours. In some the growth encroaches upon the nasal and buccal cavities, and the extreme case of Bossoma Abra is here reproduced.

Chapter III deals with pathogeny. The old theory of intranasal infection is discarded. Syphilis the author excludes by history, except in one case, who contracted the disease 15 years after suffering from yaws and 8 years after the development of goundou. At the same time, it is conceded that the evolution of the osteitis as he has seen it in his patients resembles exactly that seen in congenital syphilis, excepting only the paranasal tumours which have never been described in that disease unless Leontiasis ossea be so considered. ANTONELLI believes this disease to be a rare manifestation of syphilis. The author reminds us that when FRIEDRICHSEN and FISH wrote that syphilis was common on the Gold Coast where goundou was also found, yaws was considered to be a symptom of syphilis, and that it was yaws that was being observed. He believes that the association of goundou and other forms of osteitis is indisputable, and refers to the infant case above mentioned and the figures quoted earlier in this review. Reference is made to SCHÜFFNER'S work in showing that all serum reactions are useless in differential diagnosis.

Twenty-eight cases of the total 130 which showed considerable glandular enlargement were subjected to gland puncture and the juices examined, all with negative result. The author points out that his cases were drawn from among the uncleanly raw natives of the forest area, away from the sea coast, where yaws is common and where he believes it occurs in virulent form and accounts for many deaths among the children, although this is not borne out in the family histories of his cases.

Many interesting facts are given illustrating the rate of growth of the paranasal tumours, which in many cases lead to blindness. Except for the bony deformations other " tertiary " manifestations were not observed, probably owing to the fact that the actual endemic area of yaws was far distant. The pathological findings are fully dealt with and should be read by all those interested in goundou. The characters of the generalized osteitis as found in a single case which died under anaesthetic are also described. The skeleton of this case is preserved at the Musée Dupuytren in Paris. It shows no affection of the cranium, orbits, malar bones or zygoma, but there are present large paranasal tumours together with a general diffuse hyperostosis of the anterior part of the maxilla ; the mandible shows a similar condition affecting the anterior half on each side. The clavicles, scapulae, ribs, sternum and pelvis appear normal, but the bones of the carpus and tarsus together with the long bones of hands, feet and upper and lower extremities are all the seat of a hypertrophic osteitis with thickened and adherent periosteum. This skeleton resembles a second skeleton of unknown origin in the Museum labelled Leontiasis ossea except that in the latter the cranium is affected. The resemblance of the case to one of Paget's disease is also remarked, and the fact that this disease has been considered as a manifestation of syphilis is pointed out. No mention is made of juxta-articular nodules.

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